# SOS 4.2 Live Video PIP / Shared PIP

In SOS version 4.2, we have added the ability to play a real-time video feed into a PIP on the sphere. This feature may be useful for sites receiving SphereCasts, where, instead of needing a separate display in the SOS room to show video of the host site's presenter, the video can be shown directly onto the sphere. This feature may also be useful if a site wants to show a real-time video feed of a remote presenter onto their sphere for a particular in-house presentation.

In addition, we introduce the idea of a Shared PIP, which is a PIP that remains active across multiple clips in a presentation playlist.

## Live Video PIP

A Live Video PIP is a PIP that contains a video that is streaming either from a webcam connected to a local SOS computer, or from an RTSP stream. RTSP (real time streaming protocol) is an application-level protocol that controls the delivery of a real-time data stream, such as live audio and video.

- **How to Specify a Live Video PIP in a Playlist**

  A Live Video PIP is specified in a presentation playlist file (or in a clip's playlist.sos file) similar to how a normal PIP is specified. For example, if you are showing a tsunami dataset and you want to show a live video on the sphere of a remote presenter discussing the dataset (assuming the presenter is setup to broadcast an RTSP stream), one entry in your presentation playlist file might look like:

  ```
  include = /shared/sos/media/oceans/japan_tsunami_waves/playlist.sos
  rename = Japan Tsunami with Live Presenter
  pip = rtsp://server_name/file.sdp
  pipstyle = room
  pipcoords = 0,135
  pipwidth = 65
  ```

  In the above example, "server_name/file.sdp" would need to be replaced by the actual name of the remote presenter's RTSP stream.

  If you are using a webcam attached to your SOS computer, simply type "webcam" for the "pip" keyword, as in: pip = webcam

  The following PIP keywords work with a Live Video PIP: pip, pipstyle, pipwidth, pipheight, pipcoords, piphorizontal, pipvertical, pipalpha

Once you select this clip via the iPad or SOS Stream GUI, the live stream should pop up on your sphere as a normal pip does (note, however, it may take a few extra seconds to a minute for the stream to show up on the sphere, depending on network speed etc).

- **Requirements**
    - An RTSP source to broadcast the remote presenter: There are various live video streaming solutions available. Currently, we use Apple's streaming QuickTime technology with the freely available QuickTime Broadcaster. Other streaming technologies that support RTSP may be used. If using QuickTime Broadcaster with the NOAA SOS video server for hosting a SphereCast, you would need to contact us in advance for setup instructions (see http://sos.noaa.gov/Support/host_spherecasting.html for more information).
    - A reasonably high-speed internet connection is required to send/receive a live video feed. We recommend a dedicated bandwidth of at least 1.5 MBits/sec, though a higher 3-4 Mbits/sec is preferred.

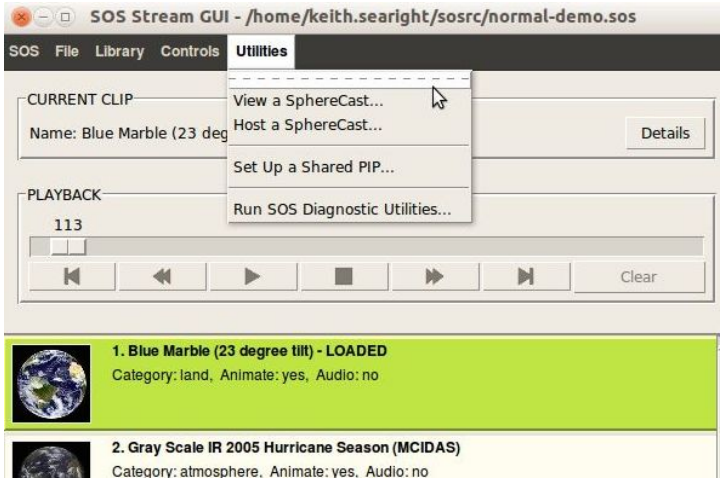
- **Limitations**
    - The webcam currently does not support audio, and may exhibit a delay in frame rate overtime.
    - Although RTSP supports both live data feeds and stored video/audio clips, in our current implementation, only live data feeds are supported for display in a PIP.
    - If the live stream is stopped by the host while a Live Video PIP is being shown on the sphere, SOS Stream GUI will hang for about two minutes, and then it will resume normal activity. So, the best thing to do if you notice a live video stream is no longer working on the sphere is to wait for at least two minutes before using any controls on the iPad or SOS Stream GUI, otherwise, you may have to manually stop SOS and restart it.

### Shared PIP

A Shared PIP is a special PIP that can display continuously over multiple clips in a playlist or between playlists. Such a PIP is useful during a SphereCast, for example, where you might have a video feed of a remote presenter on the sphere talking about a series of clips in the playlist. The Shared PIP stays active until you explicitly stop it.

In its current implementation, a Shared PIP supports Live Video PIPs and static PIP images.

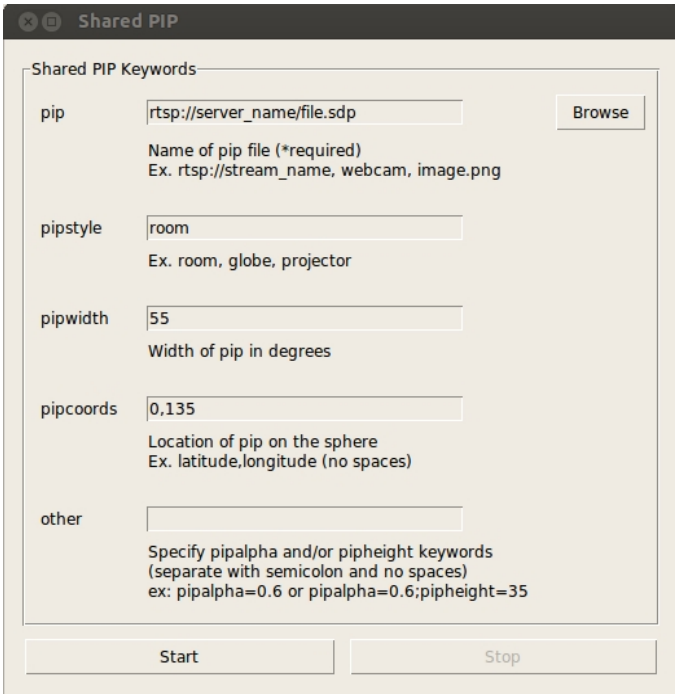
A Shared PIP is set up through the Shared PIP dialog box, located in the SOS Stream GUI's Utilities menu (see screenshot below).




In the Shared PIP dialog box that pops up (see screenshot below), you specify a Live Video PIP in the same way as detailed in the previous section. For a static PIP image, you can click the "Browse" button to locate the image on your SOS computer.

The following PIP keywords work with a Shared PIP: pip, pipstyle, pipwidth, pipheight, pipcoords, piphorizontal, pipvertical, pipalpha

Once you press "Start", the PIP will show up on the sphere, and will remain active even if you switch to a different clip. Press "Stop" to delete the Shared PIP.



**Testing Your RTSP Stream**

To make sure your live stream is valid and streams properly before trying to play it on the sphere, you can use the program “avplay” to play your stream on your SOS control monitor. To do this, open a terminal on your SOS computer and at the prompt, type the following (replacing “server_name/file.sdp” with the appropriate name):

```
avplay  -i  rtsp://server_name/file.sdp
```

If you are trying to test a webcam attached to your SOS computer, you can type:

```
avplay  -f  video4linux2  -i  /dev/video0
```

or, if that device node does not work, try:

```
avplay  -f  video4linux2  -i  /dev/video1
```