

A low cost solution to improve video projectors management and connectivity using virtualization

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INTRODUCTION & AIM

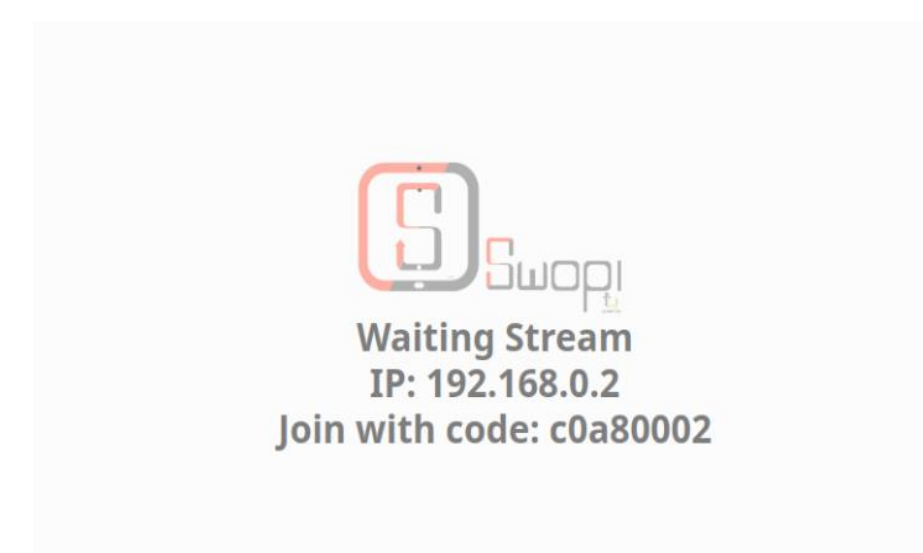
As video interfaces become more diverse, such as HDMI, VGA, DVI, etc., the growing concern about the connectivity of computers and video projectors, especially in situations where there are frequent changes of presenters and the use of various devices, is becoming increasingly apparent. There is an urgent need to find solutions that overcome physical or technical problems with content transfer, such as connector compatibility and the instability of long cable runs. The Swopi wants to resolve this problem and improve collaborative features using a low cost solutions and virtualization systems.

METHOD

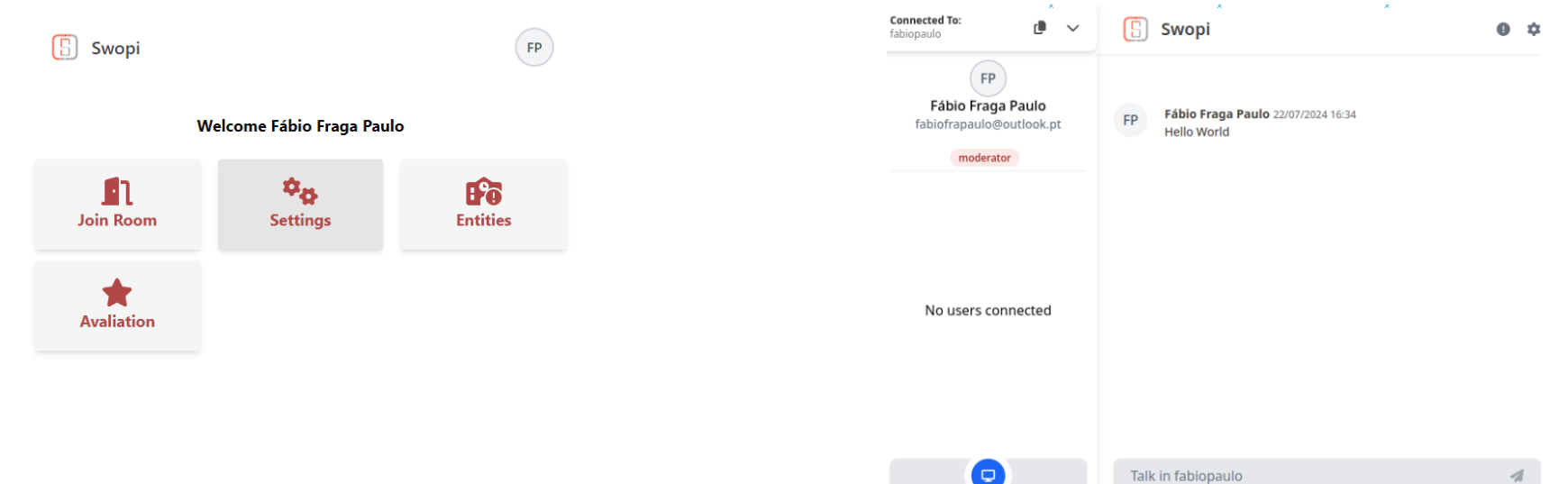
To satisfy this solution, an arquitetura was implemented based on virtual room - deployed by a raspberry pi connected to video-projector and where participants/moderators can transmit their screens, issuers' computers - computers of participants who want to or can be called to transmit into the video-projector, coordinator's computer - who takes control of the virtual room and who has access to the video projection resource. The virtual room is based on a desktop application that uses bluetooth services – used to advertise the virtual room for client desktop applications, that is deployed in a raspberry pi connected to the video-projector. Users – Issuers and Moderators, can use this resource using the swopi client desktop application, where they should be able to access many collaborative features even inside or outside of virtual room. Outside of virtual room, users have features that help in discover virtual rooms process, such as join in a room by code provided by raspberry application or searching nearby rooms using bluetooth resources. Nevertheless and inside of a virtual room users can use features like – room chat, raise hand to trasmit screen, choose monitor to transmit and one of the most important create virtual monitor. The virtual monitor creation is a key-point cause it is na approach used that allow users use a video-projector as a second monitor. The screen transmission is done using WebRTC protocols between the raspberry application and the user application who wants transmit. Finally, a mobile application was developed as well that allow moderators manage the rooms where they are, without depending of his computer.

RESULTS & DISCUSSION

The result of this project is based on 3 applications and a Server used to echange data between them. So, the images bellow represents the screen of raspberry application showed by video-projector in a "waiting for transmtion" and "transmission" stage.



The client application was a succed result as well. The next images shows how is the application outside and inside of virtual room.



Finally, the mobile application has the goal of Moderators don't need their computers to manage their virtual rooms.

CONCLUSION

Many technologies were applied to present the solution with several new features that were successfully tested and implemented. Although the current solution is not intended to replace tools such as Zoom or Teams, it should be noted that this solution can extend the useful life of video projectors with a reduced investment, offering some functions and advantages in addition to those provided by each of the alternatives.