Digital Poster Management Application on SAGE2

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Abstract

A digital poster is a new presentation media, which can be used instead of the traditional poster for presenting information at technical conferences or exhibitions. Managing multiple different digital posters on different remote displays requires a new approach that allows flexible and updatable content control across the remote displays. This paper presents an extended version of a previous prototype application for digital poster management on the multiple display environment using SAGE2 technology as the middleware. Presenting the digital poster on remote displays was achieved with a cost-effective solution using Raspberry PI computers as multiple remote display SAGE2 servers and a single master SAGE2 display server for managing the remote display servers. We extended the digital poster management application to automatically detect the remote display servers from the SAGE2 configuration file and create window views on the master SAGE2 display application of each SAGE2 controller and display on each remote SAGE2 server. We also extended the application to provide a more convenient way for the user to open and organize the poster files in PDF format, enabling the user more flexible control over which poster is displayed on a particular remote display. Future work includes application optimization and the performance evaluation of the application on the real environment.

Background

1 SAGE2

Scalable Adaptive Graphic Environment 2 (SAGE2), the open-source middleware, is the tool for creating a collaborative display environment [1]. It provides the ability for the user to manipulate multiple SAGE2 objects in multiple SAGE2 servers on laptop or mobile phone by using a web browser.

2 SAGE2 on Raspberry PI

SAGE2 can be deployed on Raspberry PI [2], the low-cost, light-weight with minimal size computer that uses Debian Linux operating system running Node.JS and Chromium, which are both fundamental requirements for running SAGE2.

3 Previous Work

Our project presents an extended version of a previous prototype application [3] for digital poster management on the multiple display environments using SAGE2 technology as the middleware with the cost-effective solution that can be achieved by using Raspberry PI boards. However, controlling multiple SAGE2 servers with the previous version is quite unconvinced so, the present application will focus on user interface and usability of the application that can help the user to organize and distribute the multiple digital posters to multiple remote SAGE2 servers within a single application.

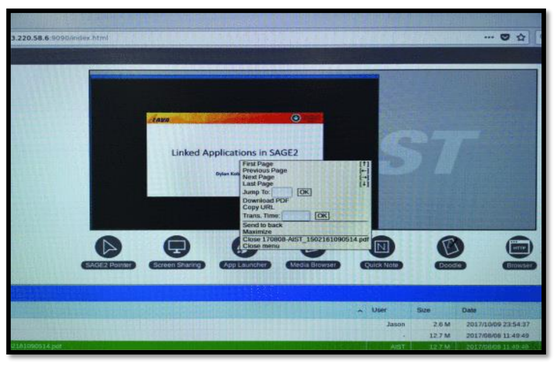

Figure 2: Previous version

System Architecture

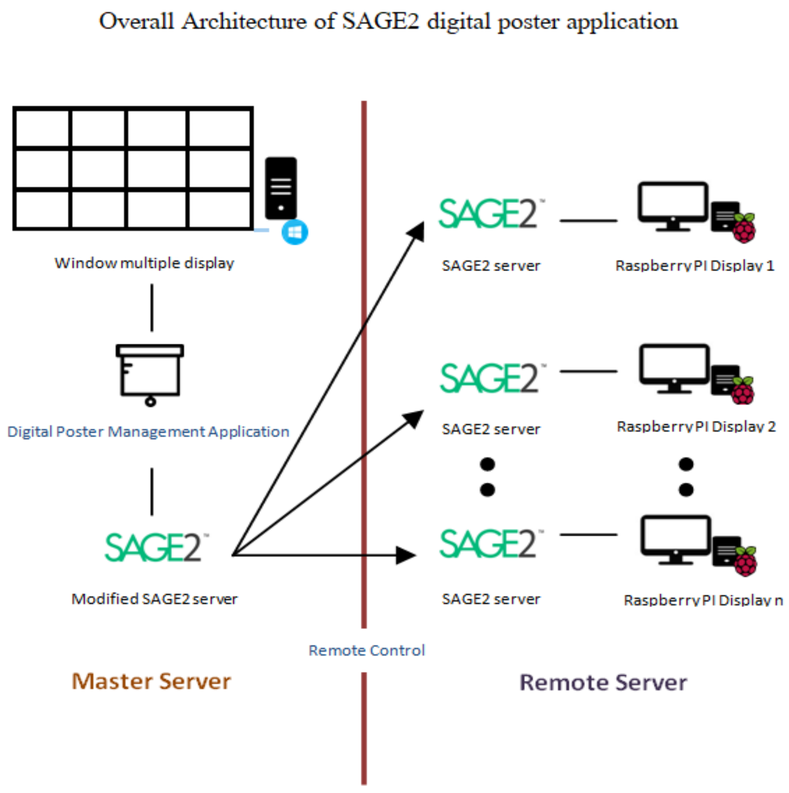

Figure 1: Overview of system architecture

Fig. 1 illustrates our system overview, which consists of two server components: the master server and the remote server.

1 Master server

The master server allows the user to manage and distribute the digital poster to the remote server via digital poster management system application and SAGE2 build-in function. In this project will use multiple display screen computer as the master server

2 Remote server

Remote servers, which are low-cost Raspberry PI 3 Model B boards in our project, are servers that manipulate and receive the digital posters from the master server. This remote server is also used for presenting the digital poster on the event.

Implementation Results

Node.js and JavaScript are used to implement this work.

Fig. 4 shows the screen output of our digital poster system. Fig. 5 and 6 present the screen outputs when the user uploads multiple digital posters to the remote server.

Generally, all SAGE2 applications use small computing resource and can run even on the low performance Raspberry PI board. However, setting up the SAGE2 server on Raspberry PI required the manual installation with several steps to start SAGE2 which do impede the usability somehow.

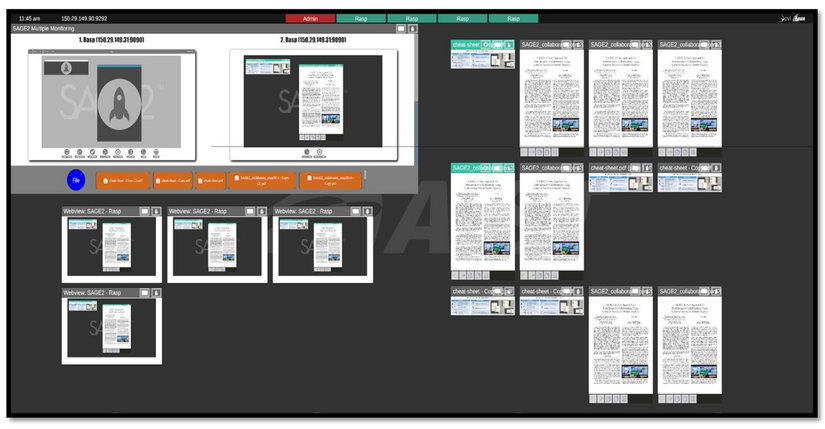

Figure 3: Application user interface

Figure 4: Pushing multiple PDF files to remote server

Figure 5: After pushing PDF files to remote server

Conclusions

We have successfully extended the low cost, digital poster management system application. The application can centralize the multiple remote servers within the single application, allowing the user able to manage and distribute the digital poster by using a combination of build-in SAGE2 function and the file function. However, its usability is limited and needs to be improved. It still cannot physically push the file to the remote site and required some time to set up the application. Our future work contains the design and implementation of the live poster for the dynamic poster presentation.

References

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