Design and Installation of a Video Conferencing Solution at the Center of Excellence in Remote Sensing Education and Research at Elizabeth City State University

Networking Team
Video Conferencing

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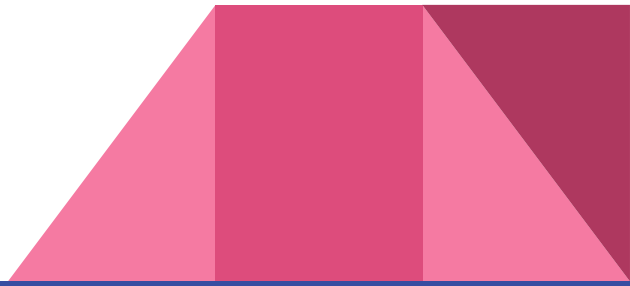
Abstract

During the 2016 Spring Semester, the Research Experience Undergraduates Networking team project identified, evaluated, and implemented a video conference solution. The main objective was to establish a fully functioning video conferencing solution in four locations: Dixon-Patterson Hall, Rooms 226, 232 and Lane Hall, Rooms 111 and 119. To understand and create the scope of the work for the project, the team had to research/analyze the rigorous standards which are set in place by the International Telecommunications Union. This agency works directly under the authority of the United Nations and is charged with issues relating to information and communication technologies. The team examined the H.323 standard for Telemedicine, how Telemedicine has evolved, and how the H.323 standard has progressively changed the way we conduct our lives. After replicating the layout of the four spaces, the next objective was to identify and evaluate a software solution. After identifying and evaluating multiple video conferencing applications, the team selected a specific application. An example of an issue which eliminated one application was when an application indicated that a user would only have to open a link in the browser to be able to connect; but it did not indicate that the link would only work from within a certain browser. As for the hardware, the technical specifications of components were used to identify the hardware components. This method of selection, immediately gave preference to specific devices. The team also analyzed the history of video conferencing and how it has evolved. This research project enables the Center of Excellence in Remote Sensing Education and Research (CERSER) participants and invited guests to engage with others through video conferencing services.

Keywords – Networking, video conferencing, CERSER, ECSU

What is Video Conferencing?

- Video conferencing is a method of communication that incorporates both picture and audio simultaneously.
- It has standards that are managed by several organizations like the International Telecommunication Union (ITU) and the International Organization for Standardization (ISO)
- The New Gold Standard for Video Compression is H.264 Standard



History

- Video conferencing goes as far back as the invention of television
- Introduction of Teleconferencing
- Major event in 1927
- Elements of video conferencing

Understanding the need- Creating the expectation!

- Current ability to perform videoconferencing
  - What are the options now
  - Locations - Dixon-Patterson Building, and Lane Hall
- Benefits of videoconferencing
  - Training Sessions
  - Meetings
  - Content Sharing
- The issues last semester
  - Poor video
  - Poor audio

Our Hardware

- Logitech Conferencecam BCC950 Video Conferencing camera
- Logitech Conferencecam CC3000e USB 2.0 Video Conferencing Camera
- The *Logitech cc3000e* is a system that has, “H.264 with Scalable Video Coding (SVC)”, “convenient Bluetooth technology and Near Field Communication (NFC)”, and is said to be likely compatible with any software that is used regularly [2].
- New MacBook Air laptops with a combination of wired and wireless connection to the internet.

The Logitech cc3000e system with the team

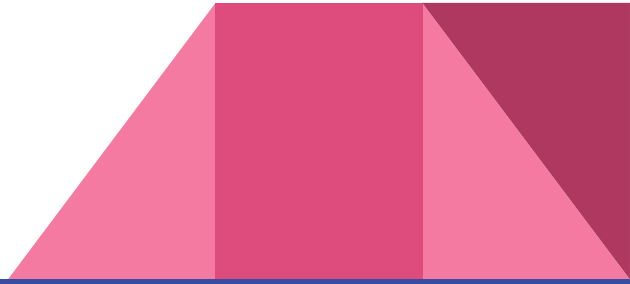
Research

A list was comprised of ten different solutions and from this pool of software collected, the team picked the most current, efficient, and inexpensive solutions from that list.

Narrowed the list further by using a set of criteria

This criteria used: *Is the solution inexpensive (or can be paid at one time without subscription service)? Is the solution compatible with different computers, laptops, smartphones, hardware, etc.? Is the solution user-friendly and efficient to use?*

Thus from those ten programs the team came up with three programs: Join.me, Skype, and Google Hangout



The Result

After collecting and testing the three softwares using a selective rating system, *Google Hangout, Skype, and Join.Me*, the team then had to conduct the analysis of the findings from the rating system.

The ratings of each team member were compiled and then averaged in an excel spreadsheet.

Figure 1 shows what was gathered

Figure 2 shows the *Network Speed* at different points of the day.

Figure 1

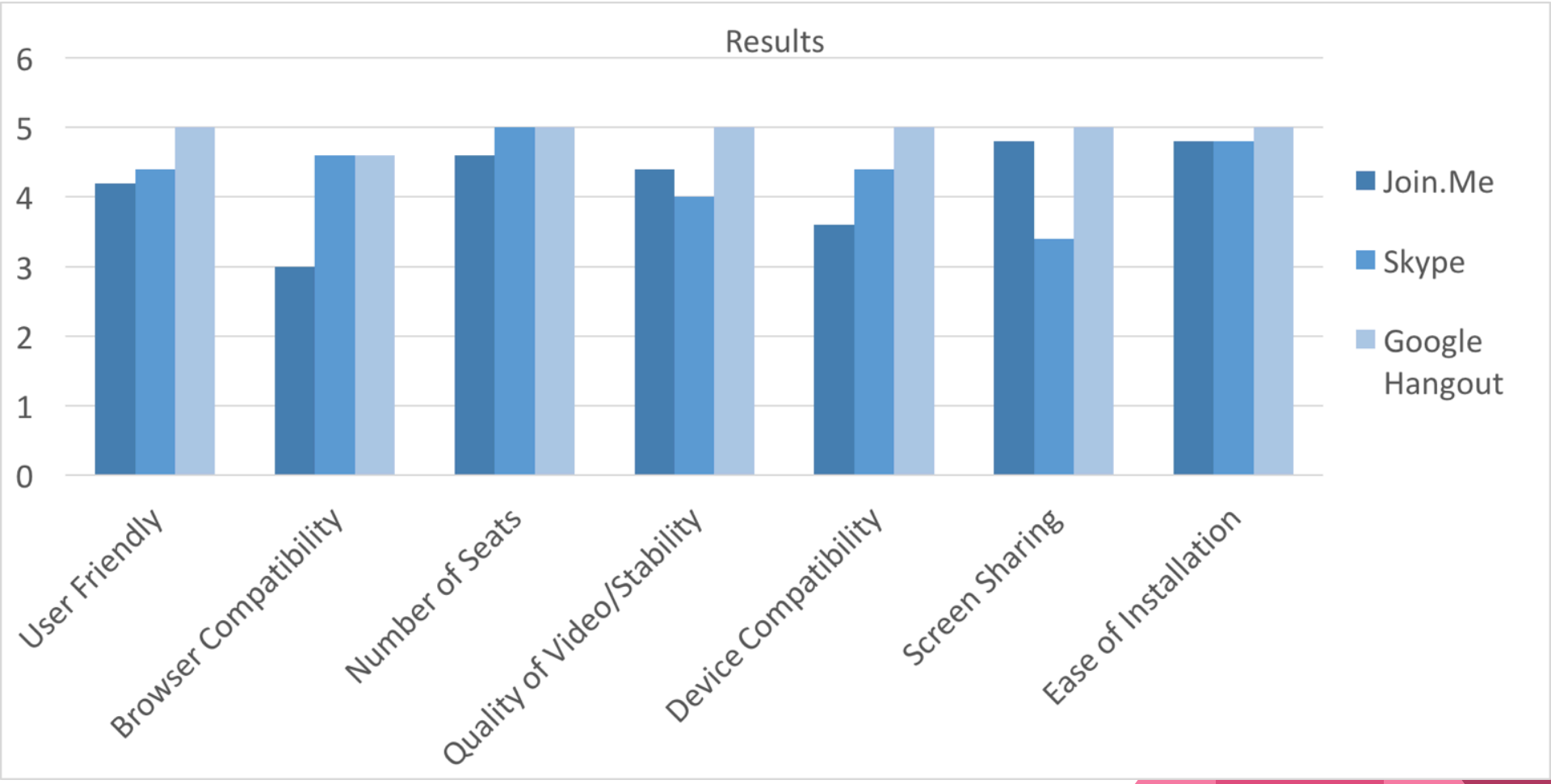
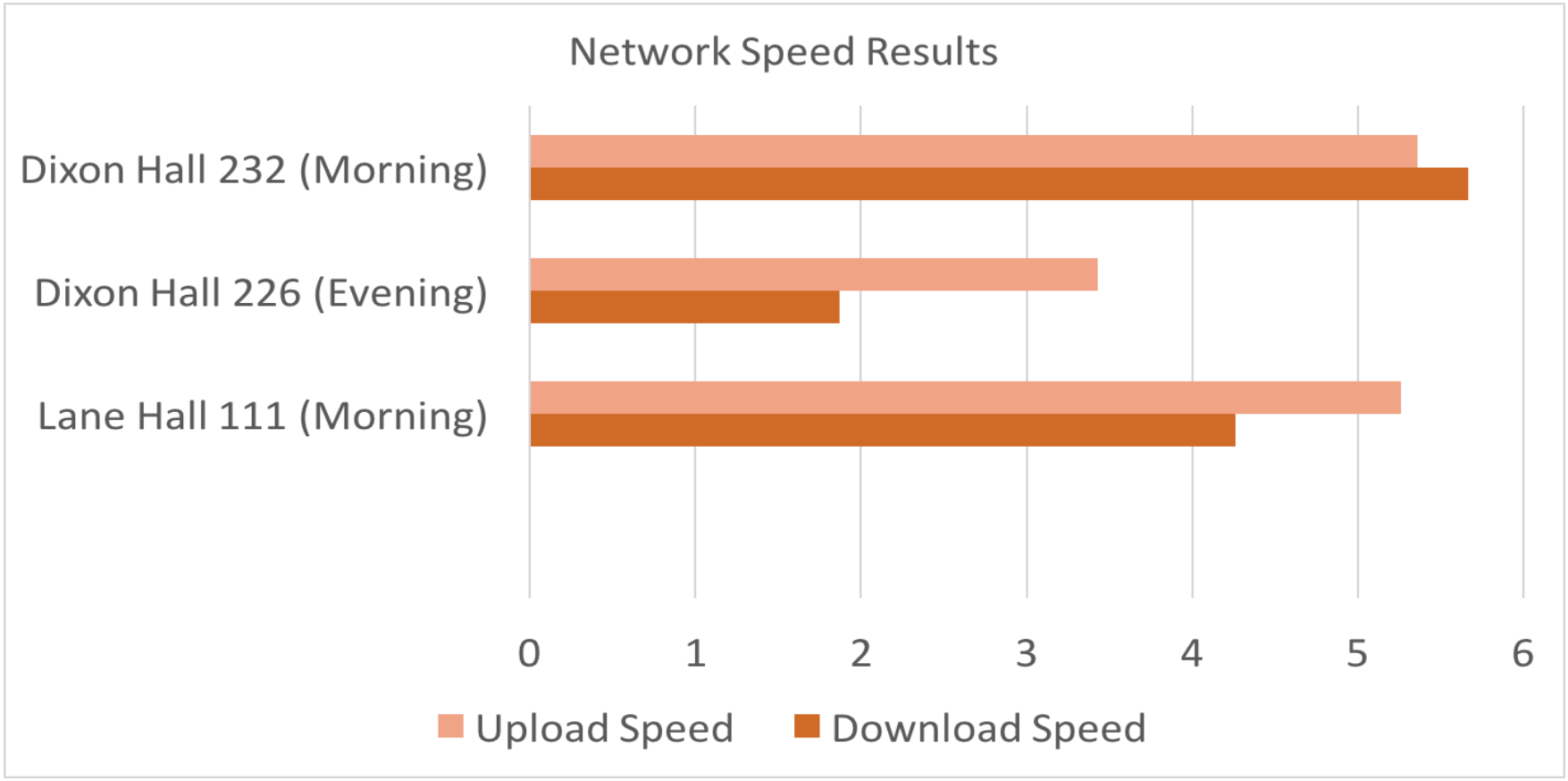

Results
6
5
4
3
2
1
0
User Friendly
Browser Compatibility
Number of Seats
Quality of Video/Stability
Device Compatibility
Screen Sharing
Ease of Installation
Join.Me
Skype
Google Hangout

Figure 2


Network Speed Results
Dixon Hall 232 (Morning)
Dixon Hall 226 (Evening)
Lane Hall 111 (Morning)
0
1
2
3
4
5
6
Upload Speed
Download Speed

Conclusion

Based on the results from the findings and averaging the numbers from the rating system, Google hangout was rated the best among all of the criterion

The best time to do a video conference in either Lane Hall or Dixon Hall would be to do the conference in early morning to the mid-afternoon. Facilitating a video conference during this time period would be the best time.

Future Work

In continuing this project, the hope is to enhance the environment in which video conferencing take place.

a. Add better lighting in both Lane Hall and Dixon Hall and adding the signage of the university in the background of each video conference location.

b. Furthermore, the research would also obtain better audio so that attendees can hear each other clearly and concisely.

c. In the future, the research would continue to test Google Hangout on both wired and/or wireless connections to optimize the performance and experience for the user.

d. Understanding that the team researched free options for video conferencing software,. In the future, the research would potentially incorporate a fully paid version that would have a higher refresh rate which would mean a better quality of video compression so that the attendees would see each other clearly.

References

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Questions?