Team Members/Role:
Vibhu Dhavala, Software Engineer
Cristofer Espinoza, Hardware Engineer
Andrew French, Hardware Engineer
Caleb Kitzelman, Hardware Engineer
Samuel Rettig, Software Engineer
Jake Roskopf, Hardware Engineer

Weekly Summary

These last two weeks we have focused on two avenues: Research into data collection methods, and core Unity development. On the side of core Unity development, the base model for the 360-degree viewing is created. There has also been research into, and development of, the appropriate actions to involve RTSP (Real Time Streaming Protocol) streaming into the project. Further developments into making the project run smoother and look better will be the core focus going forward unless directed otherwise.

The data research team has investigated the measurement parameters that will be possible through Unity and other data collection add-ons/plug-ins. With every measurement/metric, it has been determined what is actually being measured. For example, network parameters for some software only relate to the local connection, i.e., the user connection to the server. The parameters have also been split up into network performance and application metrics. This will give us direct feedback on both the network performance and the application performance. This will allow us to make improvements as we develop the application.

Past week accomplishments

Vibhu Dhavala – I have been working alongside Sam and Jake on the 360 video application. I've been focusing on the RTSP video side of the application. I have been unable to find a 360 stream to test the implementation so, instead I have been looking at various ways to port an RTSP stream. Originally I was looking and vlc for

unity but Jake shared another tool he found on github that I have been looking into recently.

Cristofer Espinoza – The past couple weeks I had looked into the resources provided by the grad students to better focus my efforts in data collection. I had also researched more in depth what Unity alone is able to do in terms of measuring metrics that would be of interest to our group.

Andrew French – I have been looking over RTSP Version 2.0 to understand how it works and how it might be of use to us in order to help measure latency, bandwidth, and adjust the stream's settings. I looked over how messages are sent and received and what information the server is able to provide the client.

Caleb Kitzelman – Dove into the mirror-networking add-on for Unity projects. This add-on includes ways to measure some network statistics from an application related to how the server and client interacts. This relates to commands the client sends to the server, ping, round trip time, connection quality, etc. I also spent some time looking into quality of experience (QoE) information and monitoring through GitHub.

Samuel Rettig - Finished Core development of the Unity project. Made sure to test and push the project at core points as to have "save points" that can be reverted to if need be. Looking for aspects of the Unity project to improve, of which cannot completely be done until RTSP is included in the main build of the project. At this point making it look better will take place.

Jake Roskopf - These past two weeks I have been supporting Sam with developing the basic Unity application. I have mainly been focused on understanding the RTSP Unity Plugin and testing out ways to add it to the application. I have been waiting for the 360-stream to be initiated to have a way to validate the application.

Pending issues

Vibhu Dhavala – Testing implementations for RTSP streams and determining what the most optimal method is.

Cristofer Espinoza – Determining what tool(s) would be best in providing measurements that are requested by the grad students and to what extent. Most tools seem to only be client based (local i.e. application) or from the data center to the client.

Andrew French –Not all servers have the same information available, and we don't know what information our server will have available. So, I'll need to request different information from the server to find out.

Caleb Kitzelman – None

Samuel Rettig – Further testing + improvements to the project, learning how to put the project onto the XR headset

Jake Roskopf – Adding RTSP stream to texture

Individual contributions

NAME	Individual Contributions *(Quick list of contributions. This should be short.)*	Hours this week	HOURS cumulative
Vibhu Dhavala		5	61
Cristofer Espinoza	Research Unity capabilities for measurements	5	50
Andrew French	Research on RTSP Version 2	5	71
Caleb Kitzelman	Add-on research and characterization	6	62
Samuel Rettig	Core Unity Development	9	70
Jake Roskopf	Random Unity work and RTSP testing	6	72

Plans for the upcoming week

Vibhu Dhavala: I hope to be able to access the 360 video stream to test implementations for projecting the RTSP stream on a texture.

Cristofer Espinoza: The goal for the data acquisition team is to implement a measurement tool from one of the ones we had researched to start collecting data and to help the grad students when/where needed.

Andrew French: I will look into how to send RTSP message to our given server to see what type of information the server has available. The use to our data collection is dependent on the servers having certain information available, which they may have, but are not required to have according to the standards.

Caleb Kitzelman: Implementation of plug-ins and Unity testing. Begin work on collecting data on application and local connections. Research study on network data collection/measurements.

Samuel Rettig: Develop the Unity project with improved visuals, rate of data transmission (if possible) and other probable improvements. The largest plan is to connect the project to the headset with the current configuration and see how it works. If most of the feature's work, further steps can be laid out with the graduate students and Dr. Hongwei in terms of what they would like to see in it.

Jake Roskopf: I am planning to continue working on RTSP streaming in Unity. I then plan to start working on testing the application with the headset to see if there are other updates we want to make.