

ConnectUC

By:

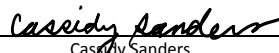
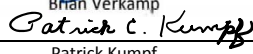
Cassidy Sanders, Jeff Witte, Tung Do, and Tyler Shelton

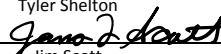
Submitted to

The Faculty of the School of Information Technology in
Partial Fulfillment of the Requirements for the Degree
of Bachelor of Science in Information Technology

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University of Cincinnati
College of
Education, Criminal Justice, and Human Services

April 2017

ConnectUC

for

University of Cincinnati

Prepared for:



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April 2017

Table of Contents

Abstract.....	1
1. ConnectUC Problem Statement.....	2
1.1 Introduction	2
1.2 Project Description.....	2
1.3 Problem.....	4
1.4 User Profile.....	4
1.4.1 Application Title	4
1.4.2 Potential Users	4
1.4.3 Related Experience	4
1.4.4 Frequency of Use	5
1.4.5 Software Used.....	5
1.4.6 Task Experience.....	6
1.4.7 Pivotal Design Requirements	6
2. Project Management	8
2.1 Budget.....	8
2.2 Objectives/Deliverables	11
2.2.1 Semester 1	11
2.2.2 Semester 2	11
2.3 Project Schedule	11
3. Technical Elements	12
3.1 Hardware	12
3.2 Networking.....	12
3.3 Software	13
4. Testing.....	13
4.1 Overview	13
4.2 Scope.....	13
4.3 Logging	13
4.4 Test Case	14
4.4.1 ConnectUC vLabs	14
5. Changes in Scope	15



5.1 Centralized Website	15
5.2 vLab Environment	15
5.3 Signal Booster	16
6. Final Findings.....	17
6.1.1 UC Website	17
6.1.2 vLabs	17
6.1.3 Signal Booster	18
7. Conclusion	21
8. References	22
9. Appendix	23



Abstract

Incoming students face immense stress and extenuating circumstances when entering college. Many struggle with selecting an appropriate college major and gathering course information. Stemming from this, students may also face a financial burden after making a required hardware purchase, which only applies to certain majors, and subsequently switch to an alternate university program. Another problem which the UC community has constantly experienced, is suboptimal cell service within campus garages. Our project, ConnectUC, alleviates stress for students by taking preliminary steps to tackle these challenges. Our first step entails offering a public safety solution by implementing cellular amplifiers within campus garages. The second task involves provision organizational-scale suggestions that address the lackluster graphical capability of UC vLab. Finally, improvements in the UC domain have been conducted to clarify major-related prerequisites. Together, these tasks make up ConnectUC and make the University of Cincinnati a more appealing environment.

1. ConnectUC Problem Statement

1.1 Introduction

The University of Cincinnati (UC), a public research university located in Cincinnati, Ohio, has experienced several unresolved concerns throughout the years.

Firstly, most students attending college face an acute predicament. Approximately 75 percent of college students change their ostensible major at least once before graduation (Gordon 2007, 86). Preemptive research on course contents, therefore, is pivotal to the student experience. Such contents, however, are scattered throughout the UC websites.

Secondly, UC currently provides Allied Health, Lindner College of Business, and College of Education, Criminal Justice, and Human Services (CECH) with access to UC vLabs, a virtual desktop platform. This platform grants certain students access to university-licensed software. Students from other colleges not only lack such access but also necessitate hardware upgrades to efficiently complete assignments, e.g. video editing.

Finally, overall lackluster of cellular reception inside several garages on UC campus has proven to be a source of consternation. Additional research to address the source of such hindrance is required.

Resolution of these issues, consequently, will substantially improve current and upcoming UC students' collegiate experience.

1.2 Project Description

ConnectUC is committed to assisting all students throughout the course of their educational career. Our project consists of 3 main phases:

- Course information centralization on uc.edu domain. This will give current and future students easier access to information on majors in a related field. Knowing the correct career path from the start of a college education will save many beginner students and the university time and money by avoiding unnecessary courses in a degree that is not suited for the individual in the first place.
- Expansion of UC vLabs access for students who are from CCM, CEAS, and DAAP. This will be accomplished via virtualizing graphics cards in the existing server configuration that is currently used for UC vLabs in Allied Health, CECH, and College of Business. The issue that many students face when entering a degree within CCM, CEAS, or DAAP is that most degrees require a high-performance computer that can cost the student thousands just to complete required course work. If the students can use the virtual labs for required course work, the individuals would be able to use a smartphone, basic laptop, etc. to complete these assignments. This would also save them money if the students subsequently change their academic path and no longer requires a high-performance computer for course work. In addition, this would benefit these colleges by attracting more students who are either experiencing penurious conditions or undertaking financial responsibility into the program. This will help professors developing assignments for the course since everyone has access to the same hardware that can complete it.
- A feasibility assessment for improving cell service reception in a select garage located on campus. Our plan is to find an amplifying application that works with all existing carriers to improve cell phone reception.

1.3 Problem

The problem the University of Cincinnati faces is the innovation of projects that have taken off in recent years. There is always room for improvement when dealing with helping students find their way through college and that is the goal of ConnectUC. Information for the technology fields available at UC is scattered online and we need to centralize it all so that incoming and current students can browse through all information in one area. Another problem is that UC vLabs are not available for all students use but only for certain majors. There is technology out now to extend vLabs to DAAP, engineering and other majors so all students will be able to use the vLab environment. The last problem ConnectUC is dealing with is the cell phone reception in certain garages on campus. Signal boosters have been invented to fix this problem and ConnectUC is going to research and find out a solution.

1.4 User Profile

1.4.1 Application Title

ConnectUC

1.4.2 Potential Users

UC students/faculty/staff and prospective UC students interested in researching additional information on their college career options.

1.4.3 Related Experience

The majority of people that we will be aiming to help are non-technical and slightly technical users. Our main goal is to make college education more affordable and less mentally straining

for students of the University of Cincinnati. All of these mini projects that make up ConnectUC will not require people to have much computer experience but they will need to learn how to connect to newly deployed resources. Beyond that, users will have an easy time putting our project in use for personal gain.

Phase two implementation strives to provide processing power for graphics intensive applications. Therefore, end users would need experience with the following programs:

- AutoCAD
- SolidWorks
- Adobe CC
- Other graphic-intensive programs

1.4.4 Frequency of Use

The website and cell service will be used immensely and the vLabs will be used whenever assignments from certain majors are due.

1.4.5 Software Used

Our initial approach for the first phase utilizes Adobe CQ5; with the changes in scope, the University of Cincinnati itself may make use of the same tool, or whichever publishing tool available. For the second phase of ConnectUC, VMware was used during the testing phase, and Iray Server was adopted as our final solution.

1.4.6 Task Experience

- **The students:**
 - Will be able to find up to date information regarding their chosen major easily and efficiently throughout the website.
 - Will be able to use college provided virtual environments to complete required course work with minimal investment.
- **Faculty/staff:**
 - Can spend more time focused on teaching students who are compatible with the class.
- **UCIT:**
 - From the feasibility assessment, we will be able to justify the need for signal boosters in various garages on campus to improve cell service.

1.4.7 Pivotal Design Requirements

- Utilize existing systems at UC that students/faculty are accustomed to.
 - Easily accessible information on UC's website regarding IT majors.

Figure 1, on the next page, shows our use case diagram. It shows how the end user and IT personnel interacts with each phase of ConnectUC.

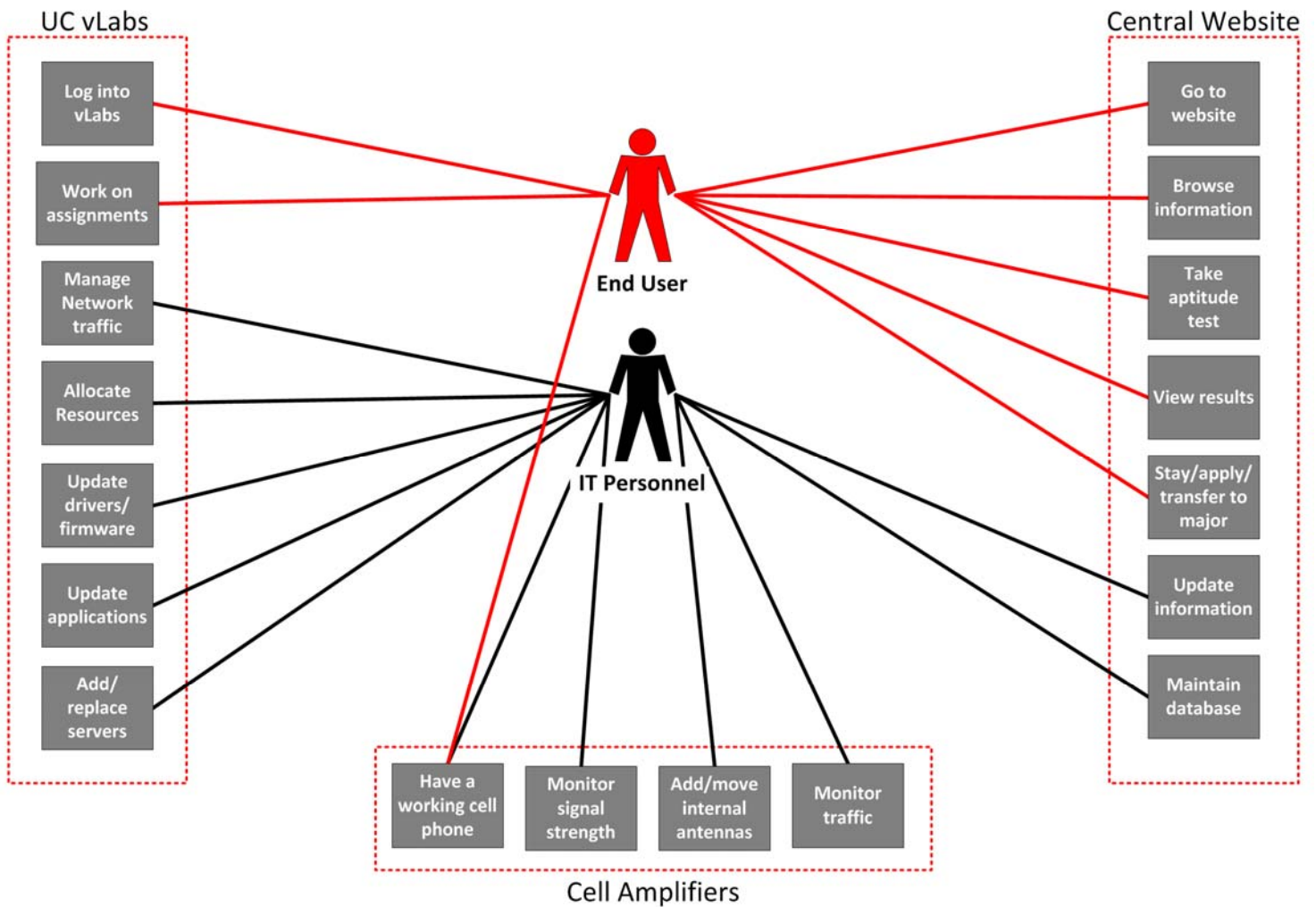


Figure 1: Use Case Diagram

2. Project Management

2.1 Budget

Tables 1 – 4 shows the predicted budget for labor and hardware throughout the project.

Table 1. Webpage Recommendations Project Budget

No.	Item	Unit Each	Unit Price, \$	Line Item Total
Miscellaneous				
1	Labor	240hrs	\$60	\$14,400
Subtotal:				\$14,400*

*Pricing is based on list price

Table 2. vGPU Project Budget – Hardware & Labor

No.	Item	Unit Each	Unit Price, \$	Line Item Total
Hardware				
1	Nvidia VCA	5	\$50,000	\$250,000
**	Nvidia DGX-1	5	\$130,000	\$650,000
Miscellaneous				
2	Labor	1000hrs	\$60	\$60,000
Subtotal:				\$960,000*

*Pricing is based on list price

**This hardware element should only be taken into consideration if the university requires additional expansion/performance based around AI development.

Table 3. vGPU Project Budget - *Software**

No.	Item	Amount	Unit Price Annual, \$	Total Annually
Software Licensing				
1	Nvidia Iray Server License	5	\$295	\$1,475
2	Nvidia Iray for 3DS MAX Plugin	300	\$295	\$88,500
3	Nvidia Iray for Cinema 4D Plugin	300	\$295	\$88,500
4	Nvidia Iray for Maya Plugin	300	\$295	\$88,500
5	Nvidia Iray for Rhino Plugin	300	\$295	\$88,500
Subtotal:				\$355,475*

*Pricing is based on list price

***This section assumes that UC adopts the current licensing agreements for various Adobe, SolidWorks, and AutoCAD software. The only thing that needs to be licensed for this implementation is the software loaded onto the server itself, so Nvidia Iray Server license and any plugin software that necessitates loading on the virtual machines should be preinstalled on UC vLabs.

Table 4. Cellular Booster Project Budget

No.	Item	Unit Each	Unit Price, \$	Line Item Total
Hardware				
1	WilsonPro 4000R	1	\$9,000	\$9,000
2	1000' Wilson 400 cable	2	\$1,000	\$2,000
3	Type N connectors	42	\$7	\$294
4	4-way Splitters	4	\$95	\$380
5	4G Omni Directional Antenna	12	\$60	\$720
6	Outdoor 4G Omni Directional antenna	1	\$80	\$80
Miscellaneous				
8	Labor	125hrs	\$60	\$7,500
Subtotal:				\$19,974*

*Pricing is based on list price

2.2 Objectives/Deliverables

2.2.1 Semester 1

- Get a group together and exchange contact information -Week 1
- Get support from Professors/UCIT- Week 1/2/3
- Research products/devices for all 3 projects
- Reach out to manufactures for demos/grant- Week 3-9
- Prepare for elevator speech/present- Week 4-5
- Training for website/hyper-V/vmware – (whenever possible)
- Proof of concept- Week 12
- Get hardware- Week 14 (end of semester)
- Prepare for presenting/present- Week 13-14

2.2.2 Semester 2

- Update Gantt chart- Week 1
- Get hardware (if we don't have already) -Week 1-2
- Design webpage- Week 1-4
- Set up environment for V Labs– Week 3-4
- Performance testing/gather information – Week 5-when executive report
- Still research for feasibility study – Week 1-3
- Verify information/testing- Week 6-9
- Prepare for presentation/expo – Week 9-14

2.3 Project Schedule

Figure 3 and *Figure 4* on the next page show the set up and timeline of our project for both semesters to keep track of time and deadlines. We have been staying close to our projected timeline thus far through semester one. Our group plans to stay on the same path throughout fall semester as well to accomplish our goal of ConnectUC.



Figure 3: Gantt Chart, Fall 2016 Semester



Figure 4: Gantt Chart, Spring 2017 Semester

3. Technical Elements

3.1 Hardware

- Server
- Cellphone Signal Boosting Amplifiers
- Graphical Processing Units

3.2 Networking

- Cellular connection [Code-Division Multiple Access (CDMA) and Global System for Mobile (GSM)]
- iSCSI
- SAN
- Virtual NICs

3.3 Software

- Adobe suite
- AutoCAD
- Database application
- SolidWorks
- VMware suite
- Iray

4. Testing

4.1 Overview

We want to make ConnectUC to be free of bugs and frustrated end users. To make this possible, we will be testing many different components of the project to make sure every part runs smoothly. This section shows the process of how we went about testing everything we needed to best finalize our product.

4.2 Scope

Our scope of the project has changed throughout the year so most of our testing is going to be focused toward the virtual labs part of our project as you will be able to see.

4.3 Logging

When or if an obstacle comes up, the team member must report it, research it and make a note of the error and resolution that they come up with. If that team member doesn't find a solution the team will come together and research it as a group to get the problem solved. Logging should be done throughout the project process for informational use and history.

4.4 Test Case

4.4.1 ConnectUC vLabs

Table 5 below shows the expected outcomes from the steps the user will perform when connecting and using the UC vLabs.

Table 5. UC vLabs Test Case.

Steps	Expected Outcome
1. User clicks Horizon View Client on system.	• Launches Horizon View client.
2. User connects to UC vLabs using provided server connection information from UC.	• Connection is fully made with End User's system.
3. User chooses the appropriate Virtual Machine to launch for their coursework.	• System checks to make sure the user is authenticated. • System prepares connection to existing Virtual Machine on server. • System displays Virtual Machine in the Horizon View Client window on the end user's system.
4. User decides they want to open AutoCAD on the Virtual Machine.	• System checks licensing of AutoCAD and launches the application.
5. User conducts graphics editing tasks, then sends a job to Iray Server via an embedded Iray plugin provided within the graphics editing application	• Server processes the job • Server subsequently makes the file available to user via a web-based portal
6. User logs in to the portal and saves the rendered file to the computer's network drive so that they can access the information elsewhere on campus.	• System must perform better than existing vLabs. • We plan to perform performance benchmarks of popular editing software in order to measure this outcome.
7. User decides to close out application to perform other tasks on their system.	• System ends session with user and clears any changes on the Virtual Machine. • System finishes and is ready for next user to connect to the Virtual Machine.

5. Changes in Scope

Throughout the working period, the scope has changed like most IT projects do. Because of these changes, our team had to come together and find out what our next steps were. Below you will see what our obstacles and changes to overcome the obstacles were for each project phase.

5.1 Centralized Website

The University of Cincinnati is still working on their website design. Over Christmas break, a lot of changes were made that we wanted to see implemented at the beginning of this project. After seeing this, we thought it would be better to make this part of the project more of a recommendation than implementation. We will be looking deeper into the website pages and give a list of thoughts and changes our team would like to see.

5.2 vLab Environment

First we started off with a server loaned to us by our advisor for the project. After installing the 1st graphics card (AMD FirePro) we discovered that though the server could recognize the installed video card, but ESXi did not support the AMD based card through various driver installs. In effect, we purchased another graphics card (Nvidia Grid K1) to test to see if ESXi would recognize the GPU. Though the server recognized the card, there was no way of passing the card through to our virtual machines. This was mainly due to the server hardware not supporting I/O passthrough in the bios, a necessity for virtualized graphics to function. In conclusion, we decided to switch over to Nvidia Iray due to its minimal hardware requirements, and for its ability to be used as a rendering machine.

5.3 Signal Booster

We initially tried to determine where to place the antennas for the booster in the buildings on campus with bad reception. We had a meeting with Nelson Vincent, the CIO and made an agenda (see appendix A for the agenda layout). Through our meeting with the CIO, we discovered the university recently removed all coax cables from every building on campus. Since our booster solution we found utilizes coax cabling, the CIO wasn't too thrilled with placing this type of cabling back inside the campus buildings. Though campus buildings were now out of the equation, the CIO recommended we consider such a solution for the garages on campus as an alternative starting point. In effect from our meeting, we chose to focus on public safety and implement a plan for garages on campus for the signal boosters.

6. Final Findings

6.1.1 UC Website

Recommendations for website

- Reorganize the majors and program listings for Computers and Technology so all the listings accurately belong in the category. The outlined Excel sheet (Appendix D) addresses such reorganization.
- Implement a type of comparison functionality to compare certain majors. This would be comparable to the Catalyst shopping cart.
- When going to the admissions page (admit.html) put the useful information (undergraduate programs, graduate programs, other) above the picture so that people do not have to scroll to the bottom. This can be achieved by reorganizing the sections, along with expanding the menu by default.

See Appendix D for recommended changes for organizing majors.

6.1.2 vLabs

We are using NVidia Iray server because of how easy the installation and implementation processes are. It is a turnkey application and it installed everything we needed. Iray is a server side application that can be used for rendering information and this information can then be redirected to clients running application specific plugins to display the information. Network diagrams can be found in Appendix B.

The Iray server's minimum hardware requirements only specify the use of CPU and memory to function. With the use of a GPU, the server will have more features available for use and allow for better overall performance. We attained a temporary license for the Iray server and client-side plugins. Our implementation allowed applications such as 3DS Max to initiate a graphics rendering job on the client machine and forward it to the server. The server would subsequently be processing this job. Provided that the user has been supplied with proper login credentials, the final product can be retrieved via a web-based portal. If you want to know more about NVidia Iray, see NVidia Iray website listed on the reference page. This is a proof of concept that allows graphics enhancement while also limiting who has access to the performance benefits. Additionally, to illustrate the scalability factor, we included budgeting information for two compatible servers. While NVidia VCA focuses solely on graphics rendering jobs, NVidia DGX-1 possesses the capability to perform more complex tasks such as AI development and Big Data analytics.

6.1.3 Signal Booster

Based on the discovery that campus garages would be more compatible with the type of cabling being adopted, we began to focus on CCM garage. This test environment was selected per feedback regarding insufficient phone signal, which arguably stems from the subterranean nature of the garage itself. The first thing we had to do was get a layout of the levels and break them up. [Figure 5](#), below, is the diagram we used for signal location documentation.

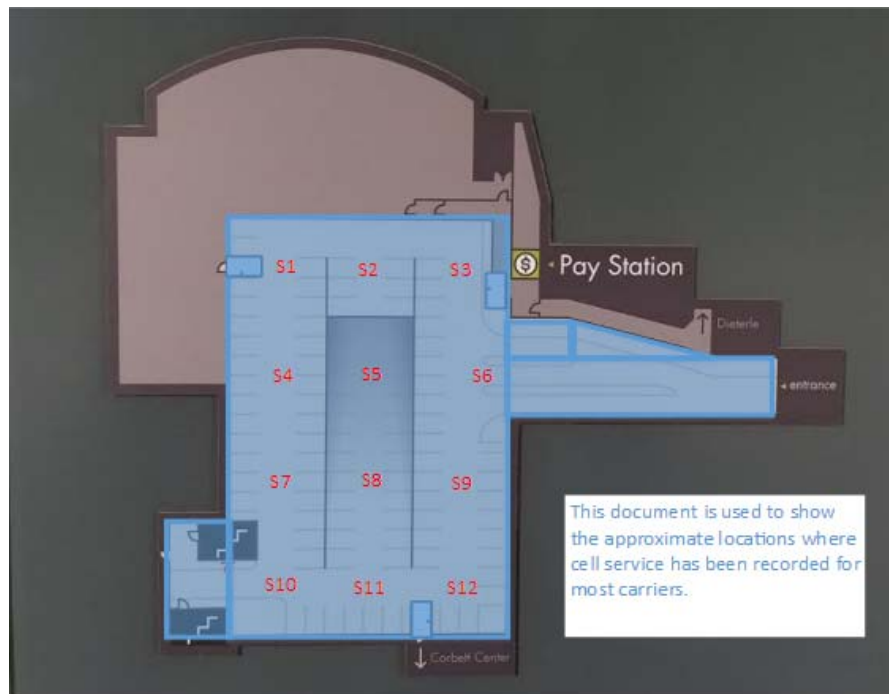


Figure 5: CCM garage layout

After obtaining this layout, we were able to use our WilsonPro signal meter to pinpoint the weak spots of these mapped areas. Located in the appendix is a comprehensive breakdown of our aggregated data (Appendix C). For the graphs, we used a standardized value, obtained by averaging the maximum and minimum signal values on each floor. From that data gathered, we created graphs and decided that the placement of the booster and antennas would be best as the following pictures show.

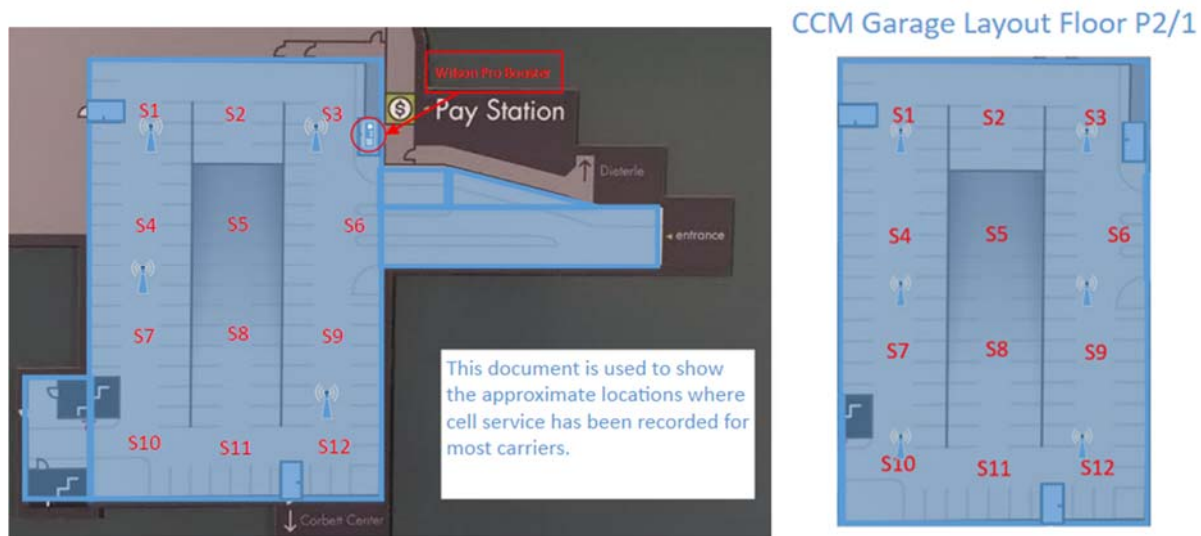


Figure 6: Booster and antenna placement

After determining the approximate locations for the antennas, we took it a step further and calculated how much cable would be needed to implement this. After taking multiple measurements of the garage we came up with P3-505.75 feet, P2-666.3 feet and P1-645.1 feet. Adding up these amounts and giving this sum a fudge factor of 1.2 would result in approximately 2,185 feet of cabling.

7. Conclusion

Throughout this academic year, we have conducted extensive research for each phase of ConnectUC. We have attended multiple meetings with our advisor and consulted with multiple external sources to accomplish as much as possible. Although our project scope changed immensely throughout this process, we are proud of the extensive research put into this and the outcomes that resulted from the project. ConnectUC promotes these solutions with the mindset that the University can always take multiple approaches to enhance the overall college experience. It is up to the University of Cincinnati to now take our suggestions and ideas and implement them on a grander scale.

8. References

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9. Appendix

Appendix A



1. Project Overview
2. Inside Building Cellular Signal Solution
 - a. Resolution
 - b. Identify areas/mapped buildings
 - i. WilsonPro Signal Meter – List price: \$529.99
 - c. Proof of Concept
3. Expand Virtual Labs
 - a. Follow up
 - b. Nvidia solution
 - i. Software and hardware
 - Nvidia Iray Server – List Price: \$295
 - Nvidia Iray Client – List Price: \$295
 - Nvidia VCA
 - ii. Scalability
 - iii. Compatible software¹
 - iv. Benefits
 - c. Proof of Concept
4. Centralize Majors Webpage
 - a. Follow up



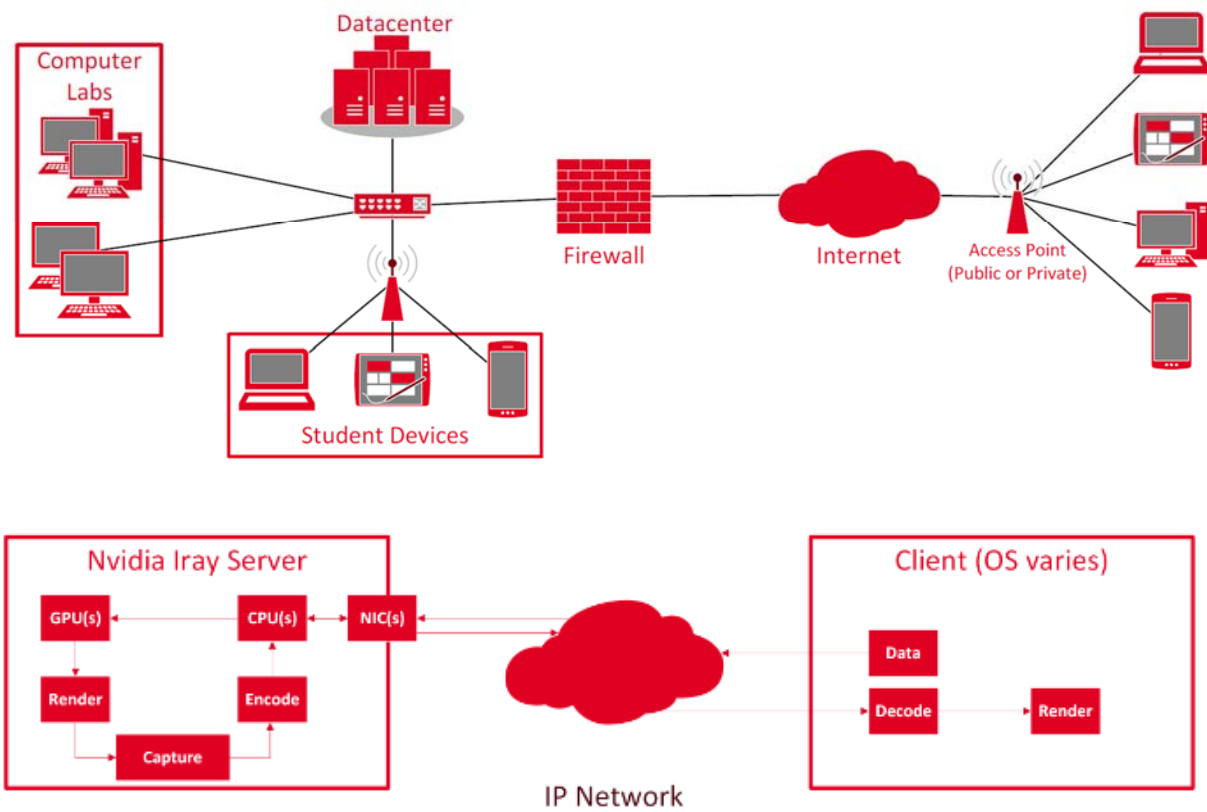
¹Iray plugins from Nvidia:



¹Integrated Iray Solutions:



Appendix B





Appendix C

LTE	Bands:	12	13	17				
CELL	Channel:	A	B	A'	b'			
PCS	Channel:	A	D	B	E	F	C	G
AWS	Channel:	A	B	C	D	E	F	

Floor P3	S1	-68	-74	-68				
		-92	-76	-101	-105			
		-74	-103	-75	-83	-74	-85	-89
		-86	-81	-82	-85	-88	-84	
	S2	-64	-71	-65				
		-89	-75	-110	-110			
		-74	-104	-73	-76	-76	-84	-85
		-88	-79	-79	-83	-78	-86	
	S3	-55	-70	-56				
		-86	-67	-110	-110			
		-66	-100	-69	-74	-79	-79	-81
		-78	-69	-72	-78	-76	-85	
	S4	-65	-72	-64				
		-92	-78	-110	-110			
		-68	-95	-71	-70	-70	-86	-86
		-77	-78	-80	-78	-80	-80	
	S5	-70	-71	-73				
		-94	-79	-110	-110			
		-75	-104	-82	-82	-72	-93	-91
		-87	-95	-93	-94	-92	-87	
	S6	-68	-70	-66				
		-81	-75	-100	-103			
		-59	-98	-69	-67	-58	-89	-81
		-74	-77	-76	-78	-73	-70	
	S7	-69	-78	-69				
		-83	-71	-110	-110			
		-78	-99	-65	-75	-72	-84	-83

	-85	-71	-78	-82	-84	-81	
S8	-70	-73	-66				
	-92	-74	-110	-110			
	-82	-104	-84	-77	-74	-88	-90
	-94	-89	-90	-93	-97	-92	
S9	-66	-74	-70				
	-90	-75	-110	-110			
	-84	-104	-80	-84	-91	-96	-93
	-93	-91	-94	-95	-92	-92	
S10	-71	-73	-67				
	-91	-74	-110	-110			
	-73	-101	-78	-74	-82	-82	-86
	-91	-83	-85	-88	-93	-87	
S11	-72	-75	-66				
	-88	-77	-110	-110			
	-77	-102	-82	-73	-80	-84	-88
	-89	-81	-77	-80	-89	-85	
S12	-64	-69	-65				
	-82	-74	-110	-110			
	-76	-103	-79	-80	-76	-83	-82
	-91	-87	-82	-90	-93	-87	

Floor P2	S1	-79	-87	-76				
		-100	-88	-110	-110			
		-82	-102	-87	-85	-77	-88	-90
		-96	-95	-93	-96	-97	-98	
	S2	-75	-85	-81				
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		-89	-104	-87	-83	-79	-95	-97

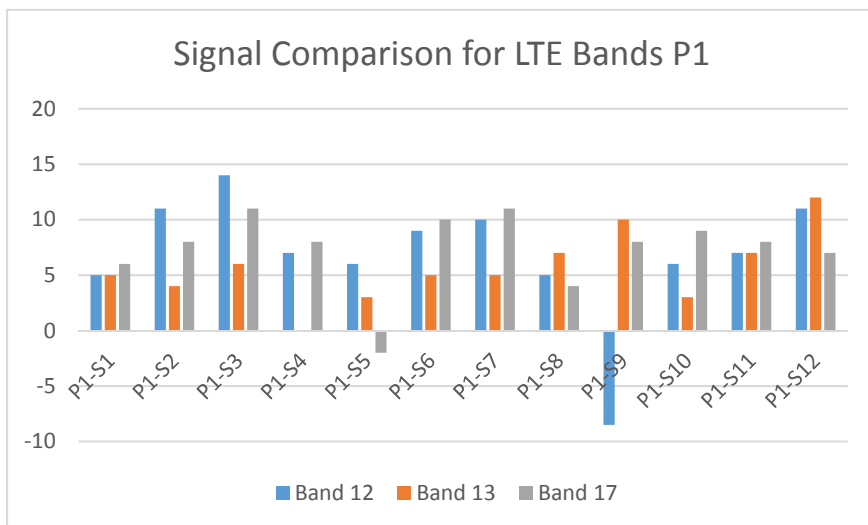
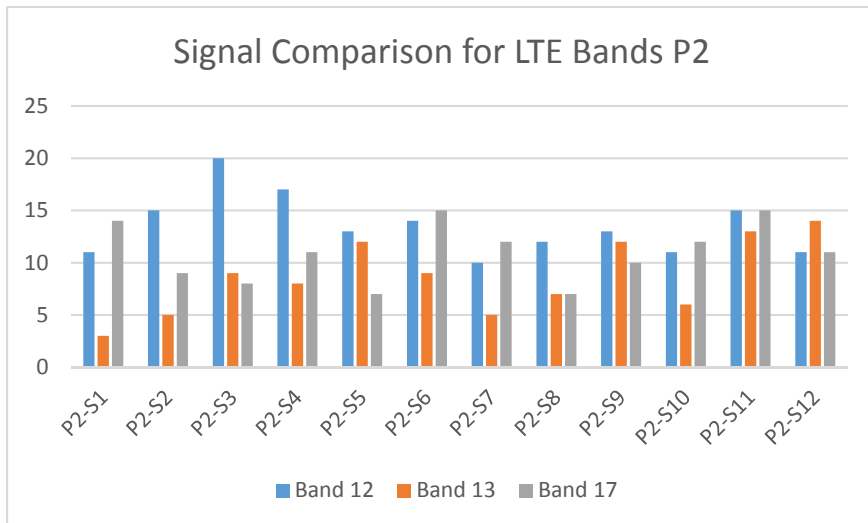
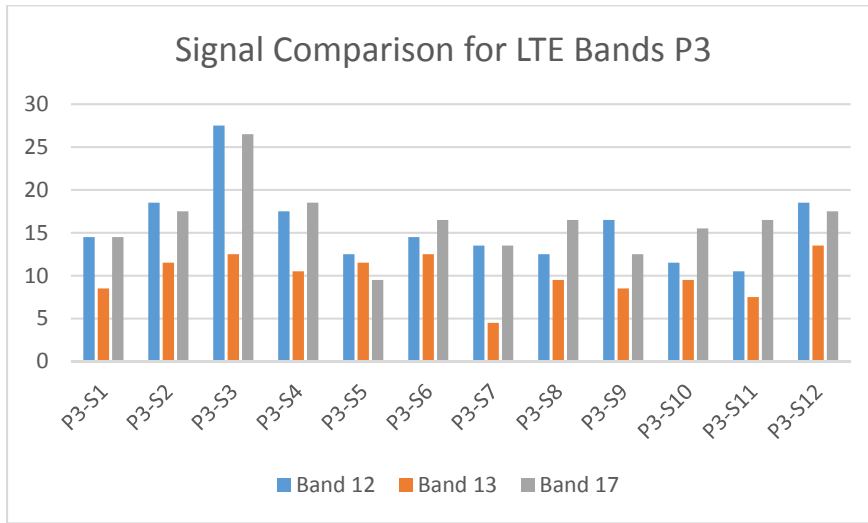


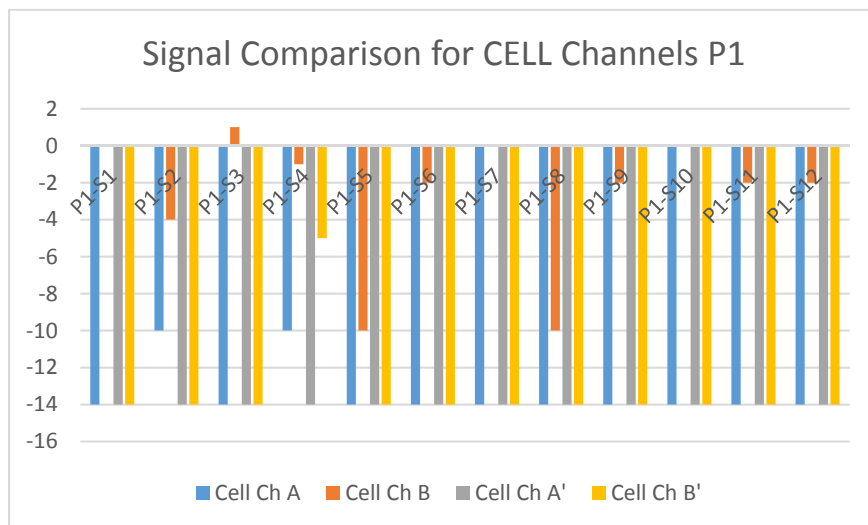
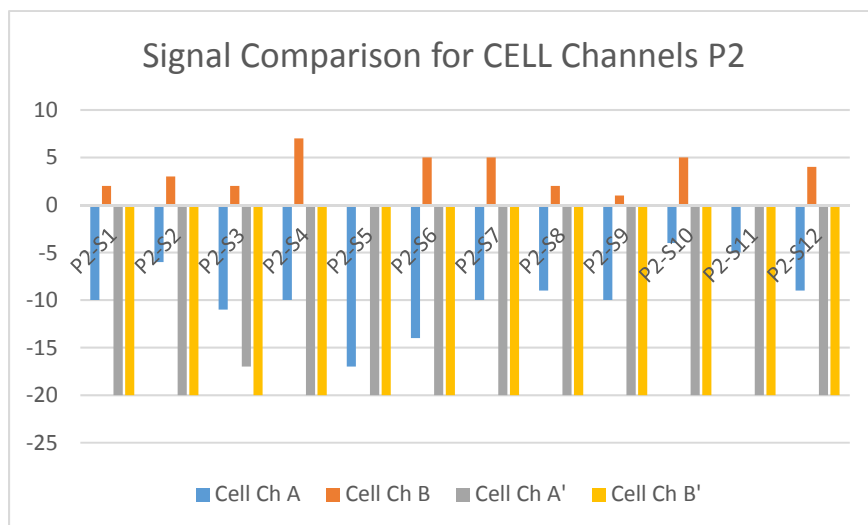
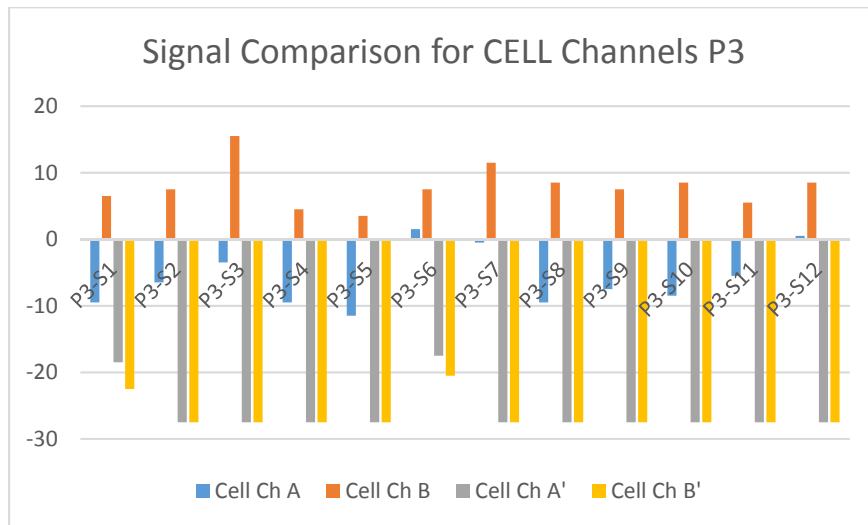
	-98	-93	-94	-96	-90	-98	
S3	-70 -101 -89 -99	-81 -88 -103 -93	-82 -107 -82 -93	-110 -87 -93	-84 -95	-93 -99	-96
S4	-73 -100 -85 -97	-82 -83 -103 -94	-79 -110 -85 -96	-110 -82 -96	-84 -95	-93 -97	-96
S5	-77 -107 -98 -110	-78 -90 -103 -107	-83 -110 -95 -109	-110 -100 -109	-99 -107	-102 -105	-101
S6	-76 -104 -89 -99	-81 -85 -103 -99	-75 -110 -91 -100	-110 -89 -100	-96 -97	-99 -96	-99
S7	-80 -100 -89 -96	-85 -85 -104 -95	-78 -110 -103 -95	-110 -84 -100	-83 -99	-96 -95	-99
S8	-78 -99 -93 -102	-83 -88 -104 -104	-83 -110 -98 -106	-110 -90 -107	-91 -103	-100 -100	-99
S9	-77 -100 -95 -107	-78 -89 -104 -98	-80 -110 -98 -101	-110 -97 -102	-90 -102	-99 -107	-101
S10	-79 -94 -93 -105	-84 -85 -102 -104	-78 -110 -95 -100	-110 -90 -104	-93 -105	-96 -100	-97

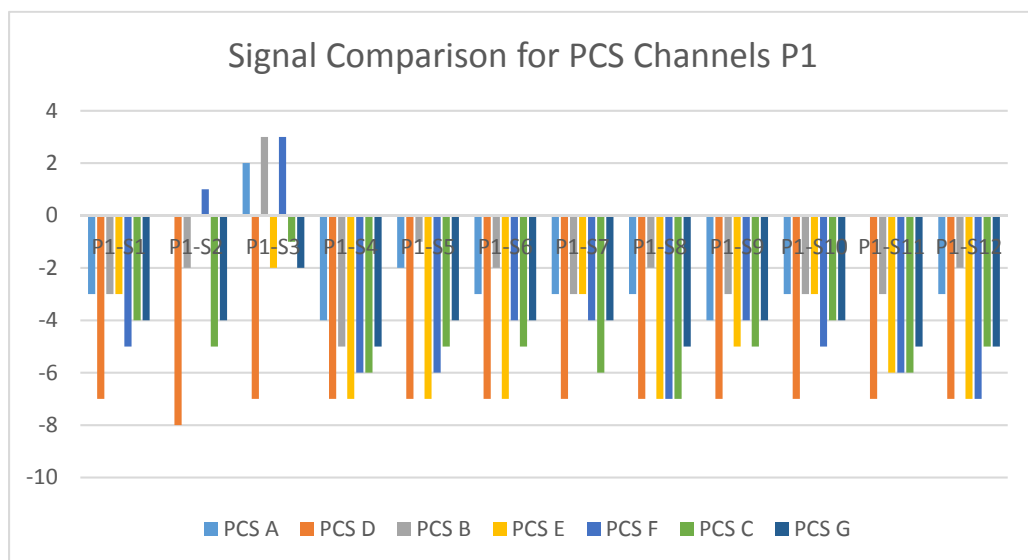
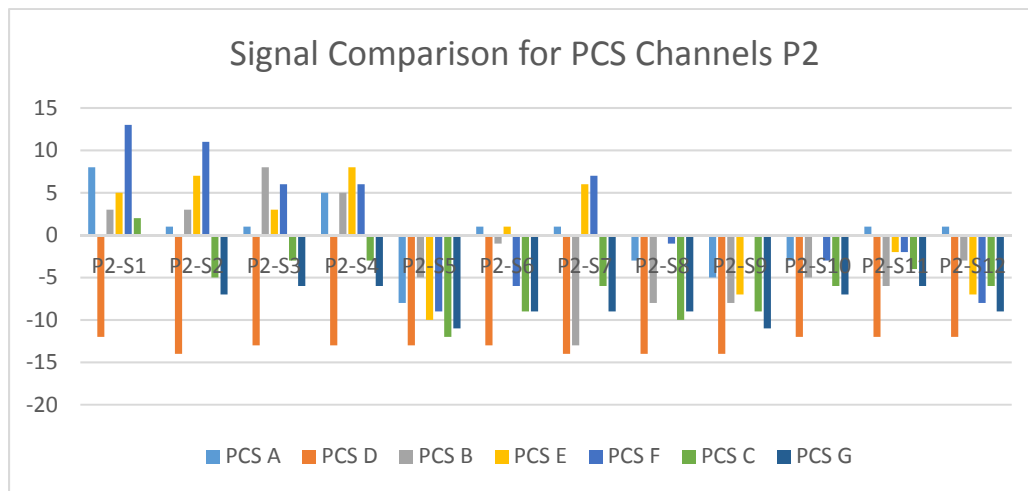
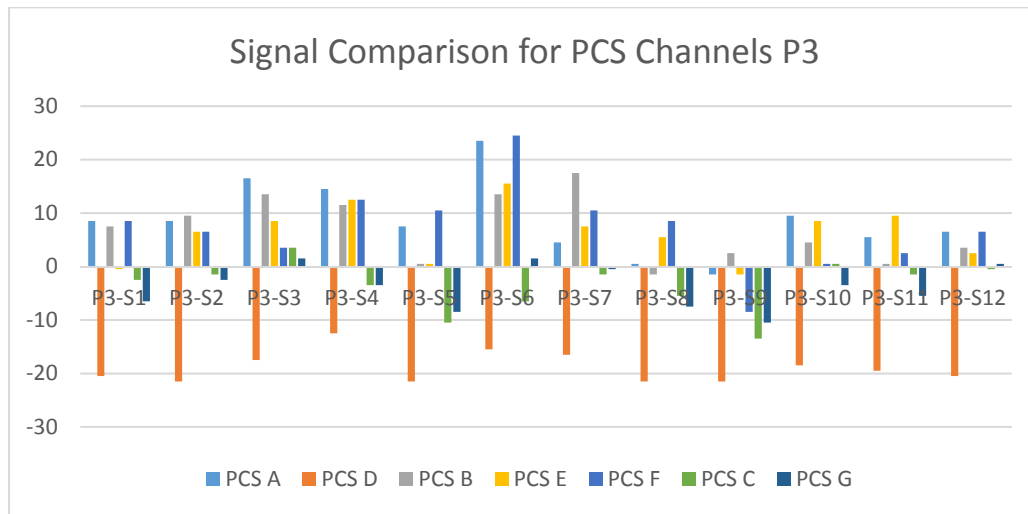
S11	-75	-77	-75				
	-95	-90	-110	-110			
	-89	-102	-96	-92	-92	-94	-96
	-98	-98	-98	-98	-108	-97	
S12	-79	-76	-79				
	-99	-86	-110	-110			
	-89	-102	-93	-97	-98	-96	-99
	-99	-102	-101	-105	-104	-96	

Floor P1	S1	-91	-91	-90				
		-110	-96	-110	-110			
		-99	-103	-99	-99	-101	-100	-100
		-109	-108	-108	-108	-109	-107	
	S2	-85	-92	-88				
		-106	-100	-110	-110			
		-96	-104	-98	-96	-95	-101	-100
		-106	-101	-106	-99	-107	-108	
	S3	-82	-90	-85				
		-110	-95	-110	-110			
		-94	-103	-93	-98	-93	-97	-98
		-108	-98	-98	-100	-104	-102	
	S4	-89	-96	-88				
		-106	-97	-110	-101			
		-100	-103	-101	-103	-102	-102	-101
		-109	-107	-109	-106	-109	-107	
	S5	-90	-93	-98				
		-110	-106	-110	-110			
		-98	-103	-97	-103	-102	-101	-100
		-110	-109	-109	-110	-109	-108	

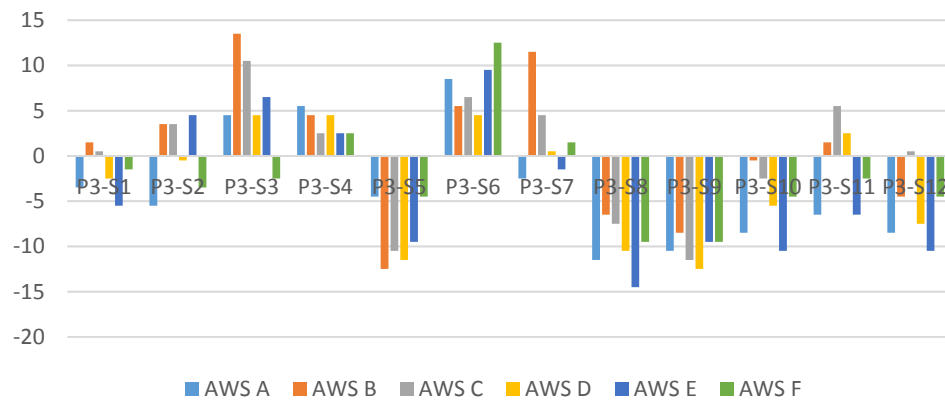
S6	-87	-91	-86				
	-110	-98	-110	-110			
	-99	-103	-98	-103	-100	-101	-100
	-109	-105	-100	-104	-107	-107	
S7	-86	-91	-85				
	-110	-96	-110	-110			
	-99	-103	-99	-99	-100	-102	-100
	-108	-108	-109	-109	-109	-107	
S8	-91	-89	-92				
	-110	-106	-110	-110			
	-99	-103	-98	-103	-103	-103	-101
	-110	-109	-109	-109	-109	-107	
S9	-91	-86	-88				
	-110	-98	-110	-110			
	-100	-103	-99	-101	-100	-101	-100
	-109	-105	-106	-107	-107	-104	
S10	-90	-93	-87				
	-110	-96	-110	-110			
	-99	-103	-99	-99	-101	-100	-100
	-109	-108	-109	-108	-109	-110	
S11	-89	-89	-88				
	-110	-98	-110	-110			
	-96	-103	-99	-102	-102	-102	-101
	-109	-108	-109	-109	-109	-106	
S12	-85	-84	-89				
	-110	-98	-110	-110			
	-99	-103	-98	-103	-103	-101	-101
	-109	-109	-109	-106	-110	-106	



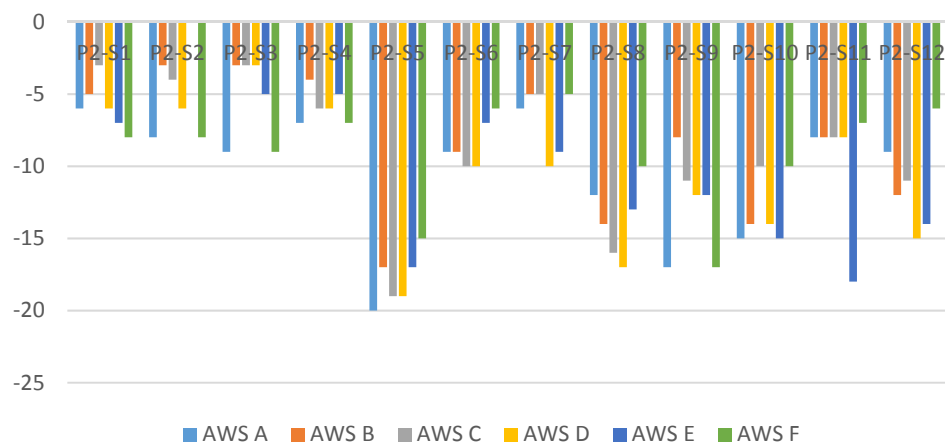




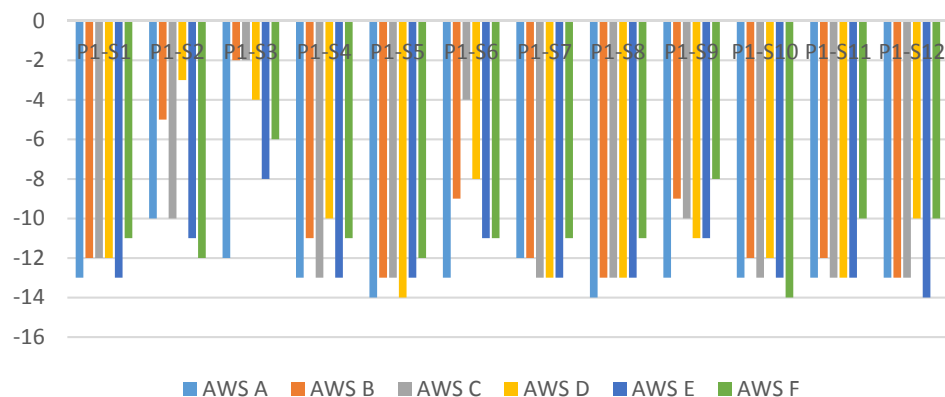
Signal Comparison for AWS Channels P3



Signal Comparison for AWS Channels P2



Signal Comparison for AWS Channels P1



Appendix D

Name	College	Categorization
Advanced Medical Imaging Technology	Allied Health Sciences	Natural Science & Math / Medicine & Health
Aerospace Engineering	Engineering & App Science	Engineering
Animation	UCBA	Performing Arts & Music / Computer Technology
Applied Administration	Clermont	Computer & Technology
Applied Administration	UCBA	Computer & Technology
Applied Graphic Communication	UCBA	Performing Arts & Music / Business / Computer & Technology
Aviation Technology	Clermont	Engineering
Biochemistry	Arts and Sciences	Natural Science & Math / Medicine & Health
Biological Sciences	Arts and Sciences	Natural Science & Math
Biological Sciences (Biology of Animals)	Arts and Sciences	Natural Science & Math
Biological Sciences (Biomedical Studies)	Arts and Sciences	Natural Science & Math
Biological Sciences (Cell & Molecular Biology)	Arts and Sciences	Natural Science & Math
Biological Sciences (Ecology & Evolution)	Arts and Sciences	Natural Science & Math
Broadcast Media	UCBA	Performing Arts & Music / Communication
Business Information Technology	Clermont	Business / Computer & Technology
Business Information Technology - DL	Clermont	Business / Computer & Technology
Chemical Engineering	Engineering & App Science	Engineering / Natural Science & Math
Chemistry	Arts and Sciences	Natural Science & Math / Medicine & Health
Chemistry	Arts and Sciences	Natural Science & Math / Medicine & Health
Chemistry	UCBA	Natural Science & Math / Medicine & Health
Chemistry	Arts and Sciences	Natural Science & Math / Medicine & Health

Name	College	Categorization
Chemistry-ACS	UCBA	Natural Science & Math / Medicine & Health
Chemistry-ACS	Arts and Sciences	Natural Science & Math / Medicine & Health
Civil Engineering	Engineering & App Science	Engineering / Architecture, Construction & Building Trades / Planning
Computational Science	Arts and Sciences	Natural Science & Math
Computer Aided Design Program	Clermont	Engineering / Architecture, Construction & Building Trades / Planning
Computer Engineering	Engineering & App Science	Engineering / Computer & Technology
Computer Networking Systems	Clermont	Computer & Technology
Computer Science	Engineering & App Science	Computer & Technology / Engineering / Natural Science & Math
Computer Systems Support	Clermont	Computer & Technology / Business
Critical Visions	Arts and Sciences	Art / Humanities / Politics, Law & Social Justice
Database Management	Educ, Crim Just, Hum Serv	Computer & Technology / Business
Digital Media	Clermont	Computer & Technology / Performing Arts & Music / Communication / Design
Digital Media Collaborative	Arts and Sciences	Computer & Technology / Performing Arts & Music / Communication / Design
Electrical Engineering	Engineering & App Science	Natural Science & Math / Engineering
Electrical Engineering Technology	Engineering & App Science	Natural Science & Math / Engineering
Electronic Media	CCM	Computer & Technology / Performing Arts & Music
Electronic Media	CCM	Computer & Technology / Performing Arts & Music
Electronic Media Technology	UCBA	Computer & Technology / Performing Arts & Music
Film & Media Studies	Arts and Sciences	Performing Arts & Music / Humanities / Culture & Languages
Foundations of Cybersecurity	Educ, Crim Just, Hum Serv	Computer & Technology / Politics, Law & Social Justice
Geographic Information Sciences	Arts and Sciences	Natural Science & Math

Name	College	Categorization
Geography	Arts and Sciences	Natural Science & Math
Geography (Environmental Emphasis)	Arts and Sciences	Natural Science & Math
Geography (Environmental Emphasis)	Arts and Sciences	Natural Science & Math
Geography (Human Emphasis)	Arts and Sciences	Natural Science & Math
Geography (Urban Economic Emphasis)	Arts and Sciences	Natural Science & Math
Geology	Arts and Sciences	Natural Science & Math
Geology	Arts and Sciences	Natural Science & Math
Geology	Arts and Sciences	Natural Science & Math
Health Information Management Administration	Allied Health Sciences	Business / Medicine and Health
Health Information Systems	Clermont	Computer & Technology
Health Sciences	Allied Health Sciences	Medicine and Health / Natural Science & Math
Information Systems	Business	Computer & Technology
Information Systems	Business	Computer & Technology
Information Technology	Clermont	Computer & Technology
Information Technology	Clermont	Computer & Technology
Information Technology	Educ, Crim Just, Hum Serv	Computer & Technology
Information Technology	Educ, Crim Just, Hum Serv	Computer & Technology
Information Technology	UCBA	Computer & Technology
Interactive Web Multimedia	UCBA	Computer & Technology / Design / Art
Journalism	Arts and Sciences	Politics, Law & Social Justice / Humanities / Culture & Languages
Journalism	Arts and Sciences	Politics, Law & Social Justice / Humanities / Culture & Languages
Journalism - Magazine	Arts and Sciences	Politics, Law & Social Justice / Humanities / Culture & Languages
Journalism - News	Arts and Sciences	Politics, Law & Social Justice / Humanities / Culture & Languages
Journalism - Photojournalism	Arts and Sciences	Politics, Law & Social Justice / Humanities / Culture & Languages
Manufacturing Engineering Technology	Clermont	Design / Engineering

Name	College	Categorization
Mechanical Engineering	Engineering & App Science	Design / Engineering
Mechanical Engineering Technology (Bacc)	Engineering & App Science	Computer & Technology / Design / Engineering
Medical Assisting Services	UCBA	Medicine and Health / Social Service
Medical Laboratory Science	Allied Health Sciences	Medicine and Health / Natural Science & Math
Medical Laboratory Science	Allied Health Sciences	Medicine and Health
Mobile Application Development	Educ, Crim Just, Hum Serv	Computer & Technology
Multidisciplinary	UCBA	N/A
Networking	Educ, Crim Just, Hum Serv	Computer Technology
Physics	Arts and Sciences	Natural Science & Math
Physics	Arts and Sciences	Natural Science & Math
Physics	Arts and Sciences	Natural Science & Math
Physics (Astrophysics Concentration)	Arts and Sciences	Natural Science & Math / Engineering / Education
Physics (Astrophysics Concentration)	Arts and Sciences	Natural Science & Math / Engineering / Education
Pre-Advanced Medical Imaging Technology	UCBA	Medicine and Health / Social Service / Natural Science & Math
Professional Writing	Arts and Sciences	Humanities / Culture and Languages / Politics, Law & Social Justice
Software Development	Educ, Crim Just, Hum Serv	Computer Technology
Web Development	Educ, Crim Just, Hum Serv	Computer Technology

ConnectUC

JEFFERY WITTE
CASSIDY SANDERS
TUNG DO
TYLER SHELTON

Problem – not user friendly undergraduate major website

└─ Solution – recommendations for website

- Came up with 3 main recommendations:
 - Reorganize majors/program listings for Computers and Technology
 - Made excel sheet to show
 - Design a comparison functionality for different majors
 - Have useful information at top instead of huge picture

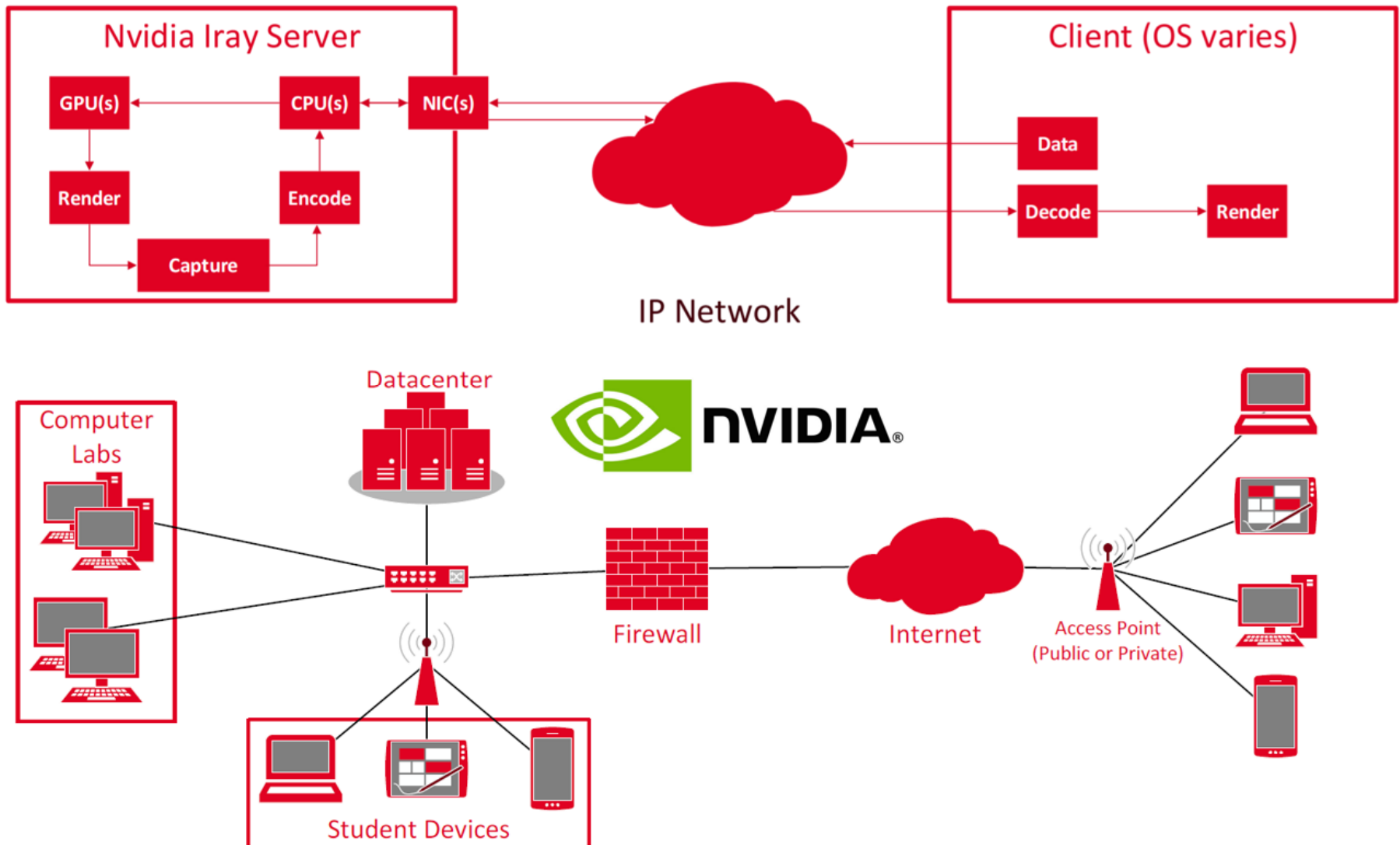
Problem – Limited applications on vLabs

└─ Solution – Iray server

- Nvidia Iray is the best solution
 - VMware has extremely limited support for GPUs
 - Iray is specifically created for remote renderings
 - Interactive streaming only for Quadro and Tesla cards (not GeForce)
- Apps loaded on client computer but uses server's resources
- Remote VR is under development from Nvidia
 - Local VR is supported



VIRTUAL GPU



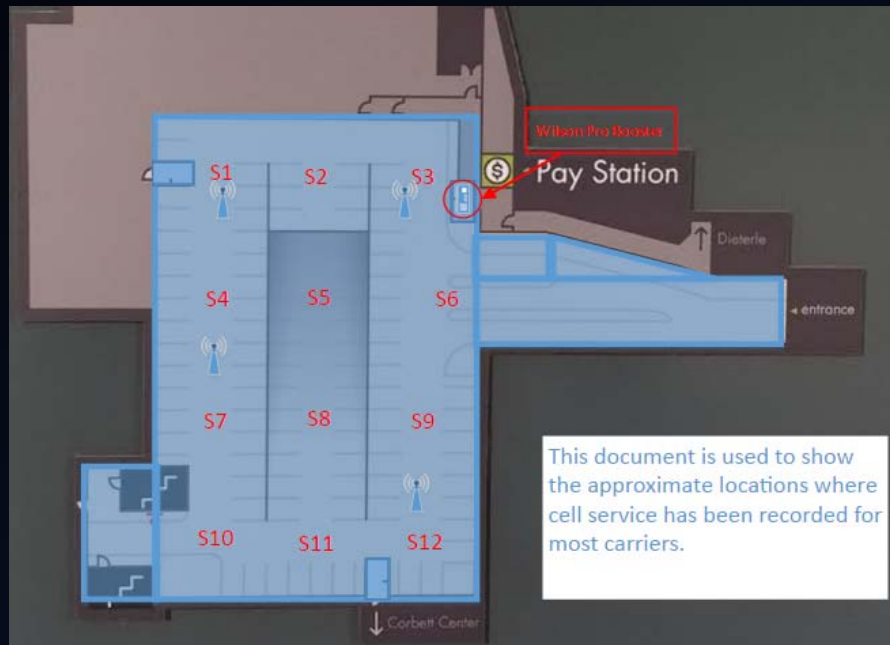
Nvidia Iray Demo (3DS Max)

Problem – Poor cell reception

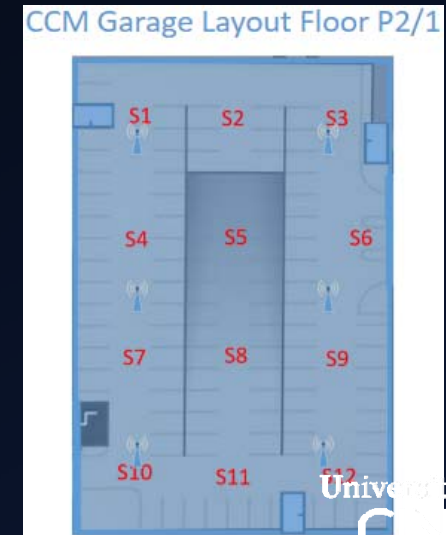
└─ Solution – Implement cellular amplifier

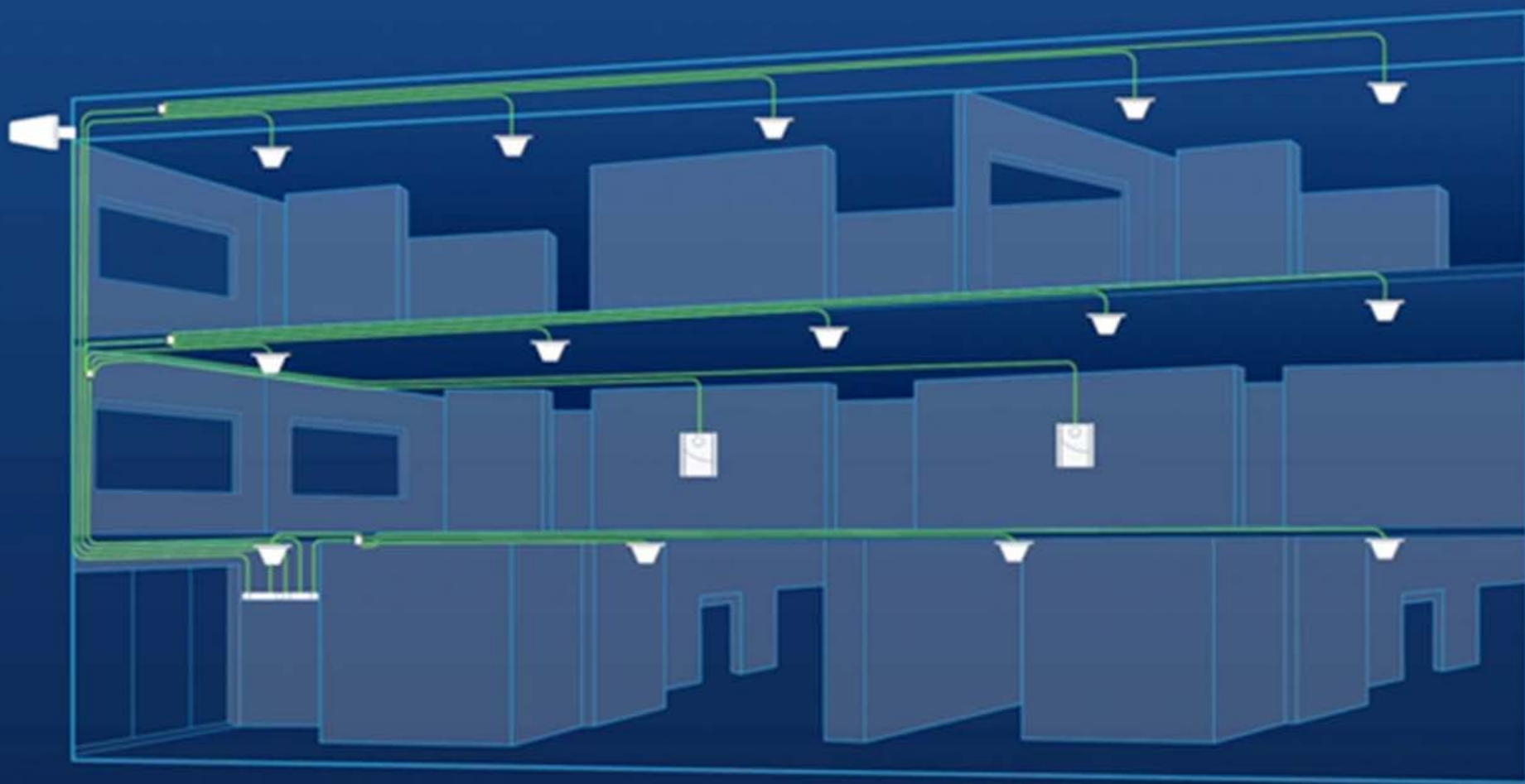
- Coax cable was just taken out of buildings
- Started to focus on CCM garage as a layout
- Mapped it out, used Wilson Signal meter, and measured the garage
- Made a map to show where to place the antennas

- Antennae placement: 4 on P3, 6 on each P2 and P1 (see pictures)
- Booster placement: in cabinet on P3



- Amount of cable needed:
 P3 – 505.75 feet
 P2 – 666.3 feet
 P1 - 645.1 feet
 Overall – 1,821.15
 with fudge factor of 1.2 =
2,185 feet





Conclusion

- Had many set backs throughout the project that lead to change in scope
- Came up with 3 solutions for problems currently at UC
- These implementations would make students have a better college experience
- The order of the projects are based on meetings with UCIT

Any Questions?

ConnectUC



ABOUT

ConnectUC, via thorough research and analysis, proposes university-wide changes. These imminent renovations seek to provide guidelines for tech-oriented students, to enhance public security, and to accommodate students whose classwork demands additional graphical processing power.

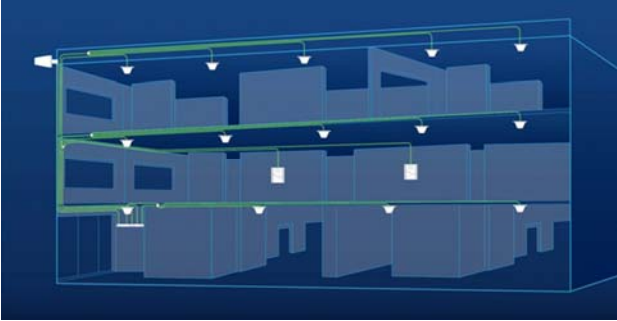
PROBLEMS

- Intermittent cellular service in parking garages posing public safety issue
- UC Virtual Labs insufficiently handling graphic-intensive applications
- Attributes for undergraduate technology majors being non-intuitively presented

PROPOSALS

- Use cellular amplifiers in parking garages
- Virtualize Graphics Processing Unit (GPU) for the Virtual Labs
- Recommend changes for current webpages

CELLULAR AMPLIFIER



UNDERGRAD WEBSITE

- Recategorize the listing in Computers and Technology
- Implement comparison function
- Prioritize links on the page

VIRTUAL GPU

