ICT Educator Webinar Series

Using Virtual Labs for Business

and Advanced Manufacturing Applications

May 8, 2020

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Welcome

THE ICT-DM SECTOR TEAM

Stephen Wright — Charlotte Augenstein — Markus Geissler — Richard Grotegut

Olivia Herriford — Paula Hodge — Ray Kaupp — Shawn Monsen — Wendy Porter

Steven Linthicum — Susanne Mata — Dennis Mohle — Duane Rinehart — Nicole Sherman

STEVE WRIGHT: Good morning, everybody, and welcome to the ICT Educator Webinar Series. I'm Steve Wright. I'm the ICT state director, and we invite you to visit our website, where you can see the ten Regional Directors that support our team from the various regions of the state, sometimes changes occurring here and there in the future, as some people will be leaving us.

On the bottom right is Nicole Sherman. She's our producer for this series, who does an excellent job of getting wonderful people to come and speak to us. And of course, Shawn Monsen, who has been our subject matter expert statewide this year who has organized this particular one, which is very timely.

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MAY 15

Remote Employer
Engagement with Nepris

MAY 29

TBD

Coming up in the future, we've got 'Remote Employer Engagement with Nepris,' which is an online platform that will allow you to do employer engagement without having to have… Well, I mean, it allows industry people to come into the classroom virtually. Nepris helps find those people. It looks like it can be used for our advisory groups and things like that, and if we're still on some sort of distancing-type thing, it may be a great platform. So, we'll learn about that next Friday.

And then we're skipping a week, and on May 29th, we've got to be determined, but I'm in talks with EON Reality about a two-and-a-half dimensional, virtual world labs for welding and nursing and other things, and I understand that some of our colleges have actually talked to them about… It should be very interesting.

WEBINAR PRESENTERS
Using Virtual Labs for Business and Advanced Manufacturing Applications

SHAWN MONSEN
IT/Cybersecurity Subject Matter Specialist, ICT-DM Sector; CIS Instructor, Sierra College

RICHARD GROTEGUT
Regional Director, Employer Engagement, Bay Region

CHRISTINA OVERMILLER
IT Faculty, Sierra College

Today, however, we're going to take a look at remote labs in the sense that we're going to utilize what we've already got going. A lot of people have responded beautifully to the situation we have where students can't come to labs. And typically, IT is one of these sectors that everybody has had access to remote labs [forever? 00:02:06] is wonderful. So, for us, the adjustment was minimal, other than saying, "Wait, how can we help other people?"

So, that's what we're going to be talking about today – the other departments, the other applications for some of the systems that we have. And with that, I'd like to turn it over to Shawn Monsen, who is going to give us an overview of what we're going to do today. Thank you.

[00:02:24]

Overview

SHAWN MONSEN: Awesome. Great. I can share my screen here… All right. So, is it in presentation mode?

STEVE WRIGHT: No, it's not. It's still showing the stuff on the side.

SHAWN MONSEN: Well, let's see… Let's try that.

STEVE WRIGHT: You got it.

SHAWN MONSEN: Awesome. Isn't technology grand? All right, so today… When it works, it's great! So, today, Steve asked me to kind of set the stage for our speakers. I'm going to be really setting the context for the experiences that they're planning to share.

Today isn't about us doing it the right way or whatever. We're just here to really share our experience in trying to meet our students' needs, moving from physical classroom into a virtualized classroom environment. So, we're going to talk about kind of the process that we went through to do that, and I'll give you a little bit of background, and then Christina and Richard will talk about specifically the things we did to get our students working in a virtualized classroom.

Agenda

SHAWN MONSEN: So, these are the topics that we're going to cover today. I'll give you a little background to talk about the challenge that we had. We'll talk about some of the characteristics of our students, some of the options that we looked at in terms of how to actually provide these labs, and then have Richard and Christina come in and actually give you real-life examples of how we're doing it in our regions.

[00:04:43]

Background

- Long history of using virtual lab environments like NETLAB+ and Practice Labs to provide technical labs for IT classes.
  - A+, Net+, Sec+, CCNA, Ethical Hacking, Forensics, etc.
- Business application classes are taught in a traditional computer classroom
- Student labs are done in the classroom on college-provided Windows-based computers

SHAWN MONSEN: So, as you all probably know, we've been using virtual labs for a long time, specifically in the area of IT-related courses – A+, Network+, Security+... All of those IT classes that we've had, we've got a well-worn path to virtual labs in that environment.

But when the COVID craziness came along and we had to shut down our physical classrooms, we did have business application classes that were being taught in a physical classroom, on a physical PC, and that software was residing on those computers. And students were used to being able to come in and sit down at a computer and do their Excel, PowerPoint, all of those Microsoft Office applications.

[00:05:47]

The Challenge

- COVID pandemic necessitated a move to online instruction
- How do we provide business applications and other non-IT labs in this new online context?

SHAWN MONSEN: So, the question became, when we got hit with the pandemic and the order to move online, how do we provide those business applications and other non-IT labs in this new online context, in this new online environment?

So, we went through a process of thinking about, 'OK, what's the best way to actually offer these kinds of classes?

[00:06:16]

The Students

- Many students don't have access to a PC
- Using Apple Mac iOS
- Using low-powered Chromebook or other non-MS-OS computers
- Non-IT students – may lack technical proficiency

SHAWN MONSEN: Part of the equation was our students, and a lot of the students taking these business applications are not necessarily technical students, right? A lot of them don't even own

a PC. A lot of them are using Apple Mac, Chromebook, other kinds of computers that may not necessarily be compatible with a lot of the solutions that are out there. And these non-IT students may lack a lot of the technical proficiency that's necessary to work in some of these environments.

The challenge is, how do we get these students moved online, considering the reality of the kinds of equipment and the technical proficiency of the students?

[00:07:15]

Virtual Lab Options

- Office 365
- VMWare
- NETLAB+
- Practice Labs
- Other providers

SHAWN MONSEN: So, some of the things that we looked at in terms of possible solutions were, obviously, within the virtual lab context… You know, can we use Office 365? Can we use VMWare? NETLAB? Practice Labs? And there were some other options as well.

Office 365

- Free to students
- Provides some of the office applications
- Web-based access
- Office software can be downloaded and installed
- Disadvantages
    - Office-lite version of software
    - Missing important features used for business
    - No MS-Access

SHAWN MONSEN: So, the thing about Office 365… The great thing is it's generally free to our students. It provides not all but some of the office applications. It allows web-based access. And

in most cases, the software can be downloaded and installed on the students' computers, if they have a computer that's capable of actually running the software.

One of the disadvantages, and probably the primary reason that we didn't select this, was that the software that's provided in the web-based context is really kind of light versions of the software, and it was missing a lot of the important features.

In addition to that, we're teaching Microsoft Access as part of our Office suite, and it's not offered in online format.

<u>VMWare</u>

- Free to students
- Provides a virtual lab environment on PC and Mac
- Can be used for any Windows-based applications
- Provides a safe lab environment
- Disadvantages
  - Steep learning curve
  - Requires OS installation
  - Requires application installation
  - Only available for MS and Mac OS

SHAWN MONSEN: The other thing that we looked at was the possibility of using VMWare. Again, in some of our technical classes, we do use VMWare and actually create virtual machines on the host computers in the classroom.

It's a great environment, but some of the disadvantages there are that it's got a really steep learning curve. It requires that students are fairly proficient from a technical perspective in that they have to install the VMWare software, they have to install an operating system image, and then they have to install the third-party software.

So, in this case, that's three layers of installation that students would have to go through to get a VMWare solution going, and we just decided that that was going to be too complicated.

Practice Labs

- Web-based virtual lab environment
- Subscription/fee-based service
- Off-the-shelf MS-Office (and IT) labs
    - Word, Excel, PowerPoint
- Can be used for most applications
- Disadvantages
    - Not used by all regions
    - Environment can be challenging for non-IT students
    - Requires admin intervention to set up lab environments
    - No off-the-shelf business applications

SHAWN MONSEN: Another solution is Practice Labs. Practice Labs is a subscription-based, web-based service. Some of our regions are actually using Practice Labs, and they do have some off-the-shelf Office application labs. So, for some regions, that might be an option for them to go ahead and choose that subscription-based service. Since we didn't have that service, it didn't really make economic sense for us to choose that.

NETLAB+

- Web-based virtual lab environment
- Off-the-shelf IT labs
- Supports custom labs
- Large installed base
- Can be used for most applications
- Disadvantages
    - No off-the-shelf business application labs
    - Not used in all regions
    - Environment can be challenging for non-IT students
    - Requires admin intervention to set up custom lab environments

SHAWN MONSEN: And then, obviously, NETLAB… So, for our two regions – the north region and the Bay Area region, NETLAB was kind of the common-sense solution for us. We have a very large installed base of NETLAB, and it has the capability to provide custom labs. So, we can actually go

in and, in the lab environment, set up whatever applications we want to run, with some technical caveats there. But pretty much, we can go in and set up whatever environment we want in this preexisting virtualized lab environment.

The cool thing about NETLAB is that it's web based, so students on Chromebooks or Macs or whatever, as long as they have a browser, they can get to these labs and perform these labs. So, it was a really good solution for us because it's already installed. We weren't going to incur any additional cost, and it hit all of those student segments that we had in terms of the kinds of students that we needed to give access to.

Other Options

- Private online training providers
    - Fee-based online services
    - Testout
    - Udemy
    - Cybrary
    - Microsoft
- Publisher's Online Labs
    - Wiley
    - Pearson
- Remote Control Access
    - Windows Remote Desktop
    - Citrix
    - PC Anywhere
    - GotoMyPC

SHAWN MONSEN: And then, finally, there are some other private online training vendors out there that have all kinds of Microsoft Office-based training. Again, it's all subscription based, so basically, you're anywhere between $50 and $150 per student to get access to those. Some of those are TestOut, Udemy… So, those are kind of pay-as-you-go, and each student would be responsible to pay the subscription costs for those.

And then, finally, the last thing that we looked at – and we're still considering for some applications – is remote control, where you actually, through a program like GotoMyPC or Citrix or Windows Remote Desktop, we can actually remote into those classroom computers and run those applications remotely.

Unfortunately, that has a lot of downside in terms of security. Often, the security folks on site don't necessarily want to provide access to those computers through their firewalls. So, that's another reason that we didn't choose that option.

Steve, did you have a question?

[00:12:45]

Experience Sharing

- Sierra College – Christina Overmiller
    - Part-time Faculty – Sierra College
    - Converting her on-ground Office Applications class to an online lab environment
- BACCC – Richard Grotegut
    - Regional Director Industry Engagement – ICT/DM Sector
    - Using NETLAB+ to provide cloud-based solutions for non-IT classes

STEVE WRIGHT: Just a point I noticed in the chat line. Debbie points out AWS Workspaces, that you should add that to your list of options. And I encourage anybody else on the call who has experienced a remote lab that you're having success with, please share it in the chat. I mean, this is an evolving topic for all of us, so we're happy to receive input.

SHAWN MONSEN: Yeah, yeah! Thanks, Debbie, for that. So, anyway, just kind of with that overview, or for having set some context, I would love to have Christina and Richard talk about their experiences implementing these applications.

Christina is actually a part-time instructor at Sierra College, and was kind of on the leading edge for our college to get this up and running, and was really the driver for making this happen at Sierra.

So, Christina, if you could, go ahead and take over. And then, Richard, when she's done, if you could, go ahead and share your experience.

Using Virtual Labs for Business Applications

- The Virtual Computer Solution
- Implementation & Use
- Challenges & Lessons Learned
- Resources

CHRISTINA OVERMILLER: Shawn, you're too modest. We couldn't have done this without your leadership and getting us connected with NETLABs. We came up with a problem, and you provided a solution.

So, let me go ahead and share my screen… Can you all see that OK?

STEVE WRIGHT: Looks good.

CHRISTINA OVERMILLER: OK. As Shawn mentioned, I teach part time. I teach the applications Microsoft Office sampler course. I come from a background of medical simulation and office technologies prior to that. We needed to find a solution for our students due to the COVID mitigation protocols, so we came up with the virtual computer solution. The resources that we would typically use for students who couldn't otherwise access Access were no longer available to us. So, we'll talk a little bit about that, a little bit about the implementation and use of NETLABs, and we will talk a little bit about challenges and lessons learned, and some recommended resources for your students, if you choose to utilize NETLABs within your facility.

[00:15:16]

The Virtual Computer Solution

The Problem

- Access does not run on Mac OS
- Over 50% students use Mac OS
- Alternate computers not available

CHRISTINA OVERMILLER: So, what was the problem? The problem was Access. Our students who use Mac OS cannot run Access natively on their machines. And typically, we have maybe two or three students per semester in my sections that have Mac OS, so they can use the lab computers, they can use the library, they can use local computers, or they can use a friend's computer. But in this case, I had over 50% of my student population in two sections that were primary Mac users. So, with COVID, we no longer had the alternate computers available to our students. And of course, this happened two weeks before we started the Access module.

Potential Solutions

- Check out campus laptop
- VMWare
- Virtual computer using NETLAB

CHRISTINA OVERMILLER: So, potential solutions… We are fortunate that, within our district, we were able to check out computers to our students, and that served some student needs. The students who didn't have a primary computer at all, or who only had a Mac computer, could check out a computer for the rest of the semester to get their work done. This is a finite resource. This is not something that could necessarily be available to all our students in a timely manner.

We discussed the option of VMWare, and I think Shawn described very well why that is a solution we did not choose for our students.

So, the remaining option was the virtual computer using NETLAB. This checked all the boxes for our student needs. It was free to students. They didn't have to download or install third-party software. It provided a learning environment that mirrored their textbook and the lecture they were experiencing, and it served a large number of students.

Additionally, some of our faculty were delivering material remotely, and they could work with their students simultaneously using NETLAB in a synchronous environment, as well as providing an asynchronous environment for course delivery for our students.

[00:17:32]

Implementation & Use

Set Up

- Create Student Accounts
- Set Reservation Maximum
- Orient Students

CHRISTINA OVERMILLER: So, our setup… Shawn set up our accounts for the faculty, and once it was set up, I logged in. And with a colleague of mine, Darla, we went ahead and explored the NETLAB environment.

As a faculty, you're responsible for creating your student accounts. You can do this individually, per student, or you can do this for your entire class using comma-separated value or text list. I chose to use the comma-separated value list to upload all my students at once. It made life much easier. The part that took the longest was simply giving students their passwords and their access information.

One of the things that we learned that we needed to do was set a reservation time maximum, the time that is the default for the system. We were only using this for 40 minutes, and that's really only 30 minutes because there's a 10-minute reset cycle time for the NETLAB environment. So, we found that this was not enough time for our students. So, that's something that, if you choose to use the system, you're going to want to keep in mind the maximum amount of time you can reserve it. If you reserve a pod, it's set for a specific time. Once that time is completed, the students either have to extend the time, if that is enabled for them, or they have to set up a new reservation.

I felt it was really important to orient our students. My biggest concern was helping them to learn the application that I was just learning myself, so I wanted to provide students with as smooth an experience as possible, knowing that the environment would be a little bit different than what they were used to – not only from an applications point, going from a Mac OS to a PC OS from their homework to this resource, but from an interactive perspective as well.

So, I created orientation materials in addition to a student user guide that was provided to our students to help students kind of navigate the system and be a little bit more comfortable with it. In our LMS, they had a resource that told them the purpose and how to log in to NETLAB, and then they had the video that showed them how to interact with it so that they could be more prepared.

Implementation

- Students Schedule Labs
- Professor Participation in Labs
- Managing Accounts

CHRISTINA OVERMILLER: So, the really neat thing about NETLAB is the students have a certain amount of control. They can control when they can access the resource. They control when they schedule and how much time they want to schedule it for within the parameters that are provided within their maximum times.

And the students have access to this 24 hours, 7 days a week. I don't know about the rest of you, but are your labs open 24 hours, 7 days a week, on your campuses? I know ours aren't. So, this really allows students to do that at their time, at their convenience.

You as a professor can participate in the labs with the students. I had a student who was having difficulty with her class assignments, and we would have had a Zoom meeting, but because of the system she was using, she couldn't hear us on Zoom, and she couldn't see us on Zoom. She could only utilize the chat. So, I was able to jump into her NETLAB lab that she had active, and we were able to troubleshoot the issues, use the opportunity to teach and learn while communicating through a chat device to help her with her work. So, it's almost like being able to walk up behind her in the lab and the computer and say, "Here's what you need to do. Here's what's going on. Show me what you're going to do here." It just made it a richer learning experience than just using email.

As professor, not only do you manage the accounts, but you also have a certain amount of statistical tools available to you to see when students have logged in, how many times they've

made, how many hours they've spent in the lab, so you have an additional resource to kind of see what your student utilization is, and you have the power to help your students with their accounts as far as resetting passwords and things like that. There are probably more features available. I just haven't hadn't had an opportunity to play with them yet because I'm still new to the software myself, three or four weeks in on this.

[00:21:51]

Challenges & Lessons Learned

Challenges

- Another Application
- Extra Layer of Steps
- Remote Control
- Disruptions

CHRISTINA OVERMILLER: Some challenges that we experienced… This is another application. It's another layer for the students to have to learn. And for some students, that's easy, and for others, technology is still very new to them.

With the extra layers and steps, the thing you have to keep in mind is that this is a virtual machine. It is in no way connected to this laptop or the computer that the student is using. So, when it comes to working with start files, especially for those of you who teach accounting, if you have start files, the students cannot just put the start files on the virtual machine directly from their computer. They have to use the cloud or an online resource.

So, for my class, the students are often provided a start file, they do the work, and then they upload the completed file. In order to do this, they need to access their LMS from within the pod, download the start files from within the pod, do their work, save it and upload it from within the pod to their LMS in order to save their work. And if they do not do that, when they close out of the pod, all of their work is gone. It's lost. It's kaput. So, helping your students develop a pattern of save your work, close the application you're working on, upload a backup to the LMS, and then

come back and resume is something that's really important to help your students learn how to do. So, there's that extra layer of steps.

For the students, some of the students had a hard concept of how NETLAB works, so letting them know it's like a remote control... If you have a toy car and you want to get it from point A to point B with your hands, you can just pick it up and vroom it. That's kind of like working on the computer on your desktop. If that same car is remote controlled, you can still get it from point A to point B. It just feels a little bit different. And that's kind of how the NETLAB environment feels for students at first, until they get used to working with that environment. So, giving them that kind of analogy helped them out a little bit.

The thing that also was an issue was learning about disruptions. Disruptions happen whether it's a power outage, they lose their connection, this fall we will go into fire mitigation again. We may have more rolling blackouts to be concerned about. These disruptions can pop the students out of their environment, and they lose all their work. So, again, helping them to remember to save frequently is really important. They need to save, close the application they're working on, upload it to the LMS, and then they can resume their work.

We had a few students who, unfortunately, lost their work early on because we didn't know about the 10-minute reset cycle in NETLAB, so that caused a little bit of frustration for our students, understandably.

Lessons Learned

- Login to Correct URL
- 10-Minute Reset
- Allow Ample Time
- Reminders to Save & Upload!

CHRISTINA OVERMILLER: So, when I got started, I had some lessons learned. I diligently created all these resources, put up a sheet of information and videos and links on my LMS, and then the students an email that included a user guide with email, trying to make it convenient for my students. And what I did was I ended up having information in two separate locations, so the

students went directly to the guide and completely ignored all the more useful resources for them. And as a result, they were accessing a hyperlink that they didn't have an account for, so it took a little troubleshooting to figure out that the information that was in the guideline was totally different than the information that I had provided them. And that was my mistake. I learned to definitely put all my information into one place, and to verify my links in my resources before moving on.

We talked about the 10-minute reset. It's really important to let your students know that those last 10 minutes of the NETLAB environment is not theirs. It's the computer's. Once that comes in, they may not be able to upload their work, so that's been a problem. If anyone knows of a different solution to that, please let me know, because I'm still learning.

My students tend to underestimate the amount of time a project will take. I don't know if any of you have had that experience, but they think, "Oh, yeah, I can do that in 20 minutes," and really it might take them an hour to get it done.

So, I've been recommending to the students to set the maximum amount of time for their reservation so that they have ample time to do their work but then to release the reservation to make the pod available to others. So, when a student registers a reservation and work on it, that reservation time is theirs, and if they leave a pod without releasing the reservation, that reservation continues to stay there, so they need to be able to release the reservation in order to open up that particular pod for someone else.

I don't think this has been made clear, but when you have a class, you can have multiple pods, so you can have concurrent users – one user to one pod. So, if you have 30 students but only 20 pods, and if they all want to use it at the same time, you're going to have a little bit of traffic, so having the students release the reservation to make the room available for someone else is a good habit to get them into.

And finally, remind your students to save their work, close the application, upload it to the LMS, and resume. It's going to become a mantra. It's something you need to say over and over again.

[00:27:35]

Resources

Keep information in one location

- Clear Directions & Caveats
- Orientation Docs/Video
- User Guide
- Save → Close App → Upload → Resume!

CHRISTINA OVERMILLER: So, the resources that we provide… Clear directions and few caveats to help the students troubleshoot the issues that they were experiencing. We provided orientation documents and videos to help the students in the multimodal learning aspects so that they could interact with the environment in a way that made sense for them. We provided that user guide, and save, close the app, upload, and resume.

And that's where we are right now. The majority of my students have logged in. They have used the service. After the first couple of days and our initial issues with logging in and the timeouts, it's been very successful for students. They've been working pretty seamlessly with the environment, now that they're familiar with it, and it's been really good for our class and for our students.

We had one student who is very frustrated with the environment. I don't think she has a good connection to it, and she's choosing to take an incomplete and work on the course when she can get back to a physical computer. But for the vast majority of my students, it has actually worked out very well, so that's where we are!

[00:28:43]

STEVE WRIGHT: Thank you, Christina. That's great.
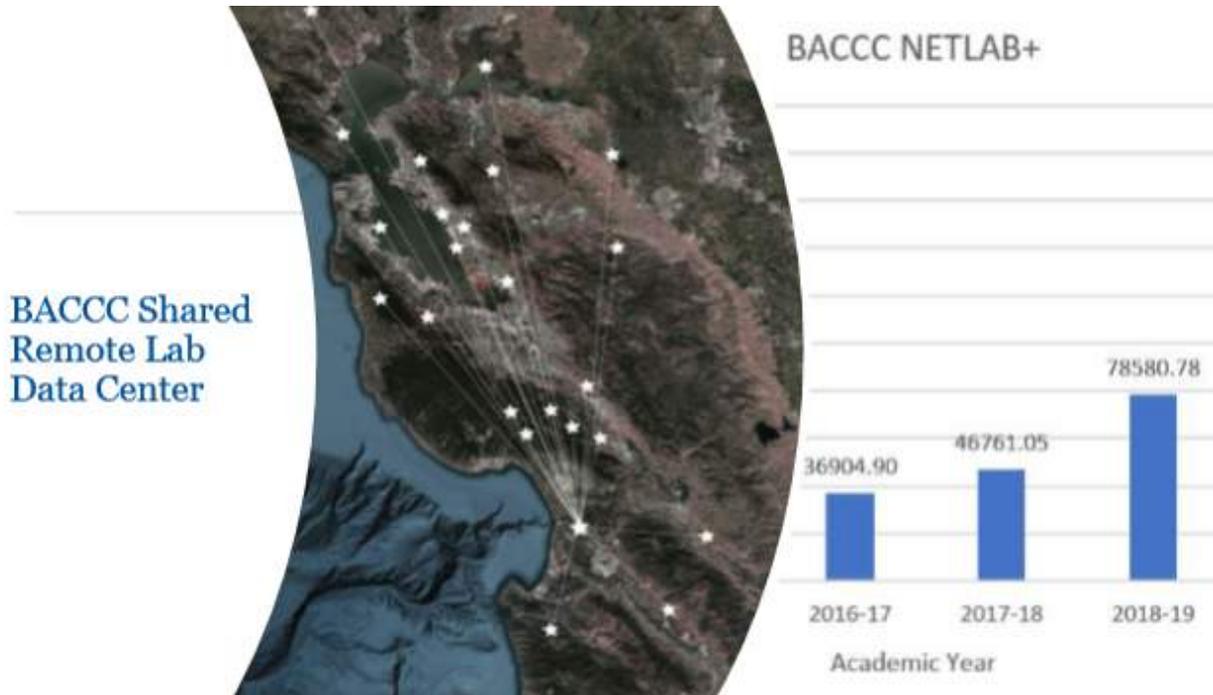
AUDIENCE MEMBER: Is it time to ask questions?

STEVE WRIGHT: I think we probably… Yeah, quick question, and we want to move on to Richard pretty quickly.

AUDIENCE MEMBER: Then I'll wait.

CHRISTINA OVERMILLER: Perfect.

BACCC Shared Remote Lab Data Center

RICHARD GROTEGUT: Thanks for introduction Christina and Shawn. So, yeah, NETLAB was actually the solution in the Bay region for our colleges as we had six colleges that have their own NETLAB systems set up, and all of the tasks with maintaining it and keeping it running, and we were quick to agree that a regional option would be the best solution. That was back in 2014. We had been using NETLAB for almost 10 years prior to that, and we were successful in pooling money together to move the data center to Cabrillo College.

And subsequently, since that first year, our use of the system has grown quite a bit. I mean, last year, we had almost 80,000 hours of students' labs completed on our shared NETLAB system, and we have 20 of the 28 colleges using it quite a bit, and additional ones coming on board this year.

We were presented with an opportunity to do more with NETLAB. You know, we had typically taught our IT classes, but now, with the COVID pandemic and with the open labs at all the

colleges… And every college has an open lab that students can come in and do their work at. Those are shuttered and closed down and not accessible, so we've been asked to schedule something.

Typically, open labs are only open on certain days of the week, like not on the weekends, and certainly not late hours. NETLAB gives them an opportunity to get in, come in, and use a computer any time they need to use one.

So, Christina did a great job of showing how the students react and use Office products, and we did the same. We a couple of colleges using Office for the very same reasons Christina pointed out – you know, the need to have access to Access and all the tools and the ability to save.
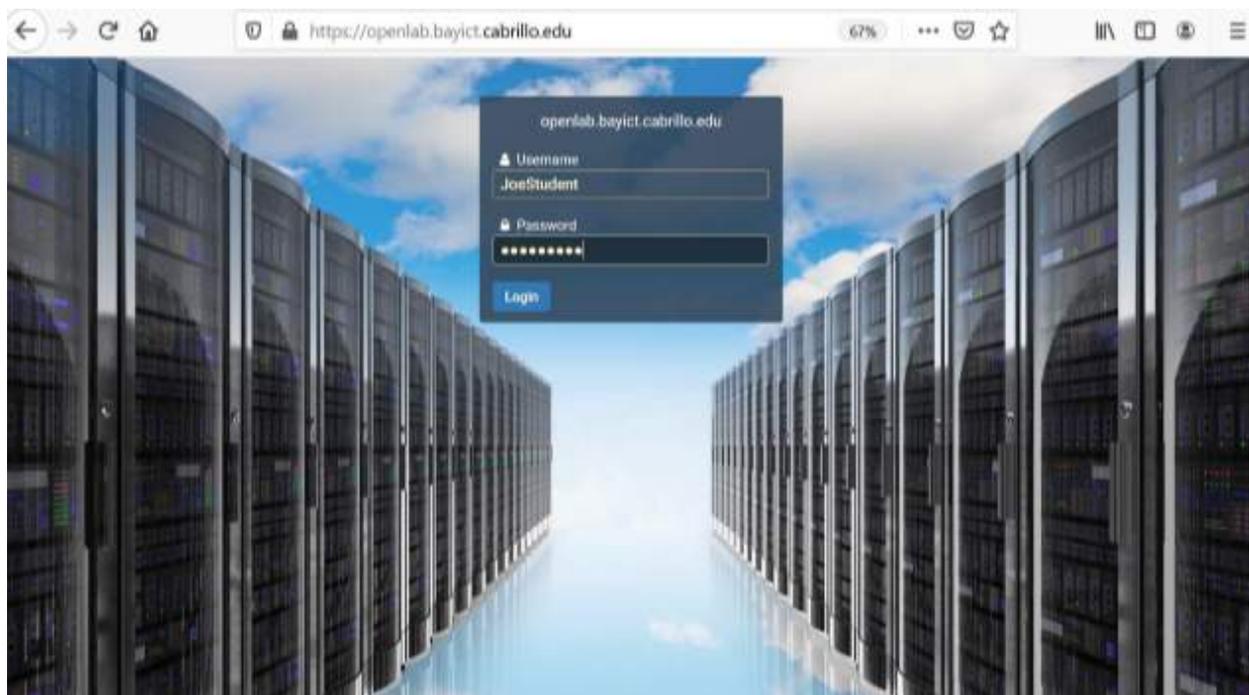
Students get an account. That's another step, so they do have to have another login, it's another URL they have to go to, another password they have to remember. They log in… This is our homepage for the Bay ICT NETLAB shared environment.
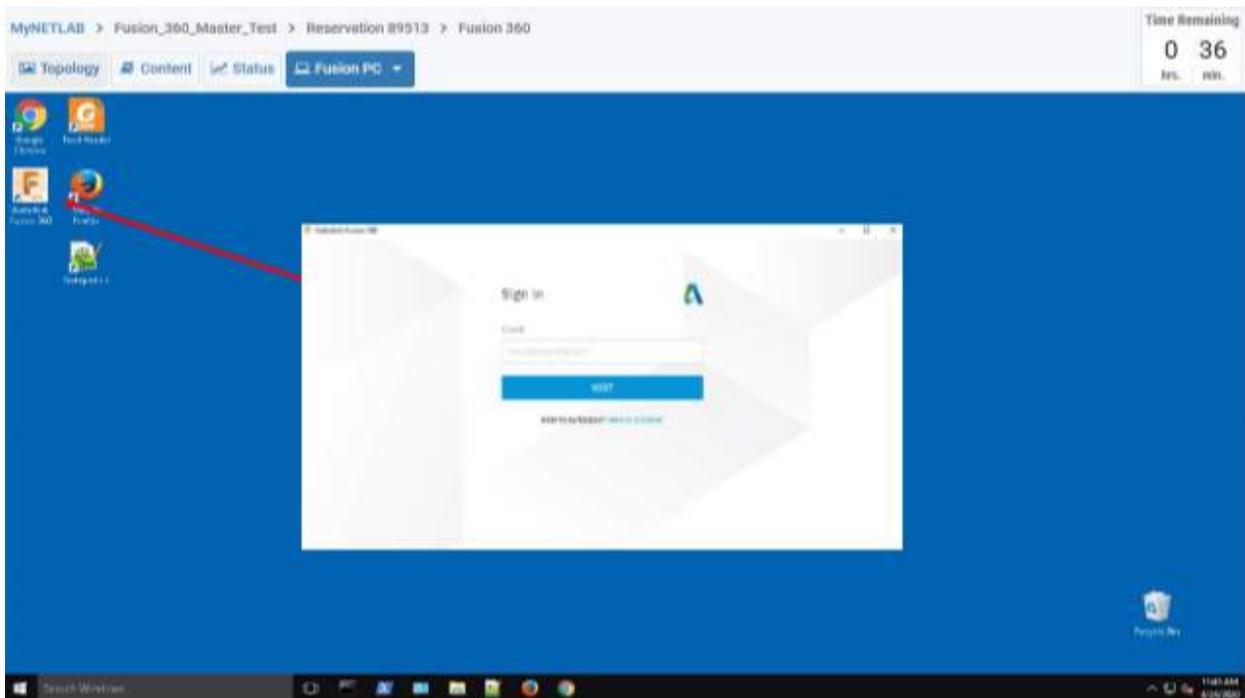
User Workstation

When they log in, it's a very sparse homepage. It looks like this, and they can schedule a lab time, a reservation on the lab. So, they click on that... In this case, we actually have it set up in the same kind of way Christina and Shawn have done with Microsoft Office instead of Fusion 360, which was a demand from our manufacturing and engineering instructors, who were faced with no place to have their students do their labs, as their labs with computers to run Fusion 360 were no longer accessible. So, we've set that up and piloted Fusion 360, and it works quite well with our existing NETLAB hardware.

Like Christina said, they pick the date when they actually want to log on, set their schedule, their time. There will be multiple pods. We only have the one Fusion 360 pilot pod set up, and we can easily copy that to as many as 30 instances. So, it would be just like if they were to walk up to an open lab system. There would be 30 computers there, some of them being used by students, some open. They can sit at one, pick the time, and begin doing their work.

The lab reservation shows up in their homepage. As soon as the screen access button lights up, they can click on that, launch the virtual machine, and do their assignments.

Now, the other thing is instructors see this as well and can log on simultaneously, so they can work synchronously with students who are working on a project and stuck, and instructors can help them directly with that.


Once they launch the lab, we present them with a little interface and some icons. This is the PC that they've chosen to us as the User Workstation. They click on that, and it launches a Windows 10 environment for them, virtualized. It has Fusion 360 installed on that image. Right here is the desktop icon to launch the program. With Fusion 360, they have to have an account with the company. They get that for free. NETLAB is free also. They enter their credentials and can log on using the application in their browser – on a Mac, on a Chromebook, on any device that they have internet access and a browser.
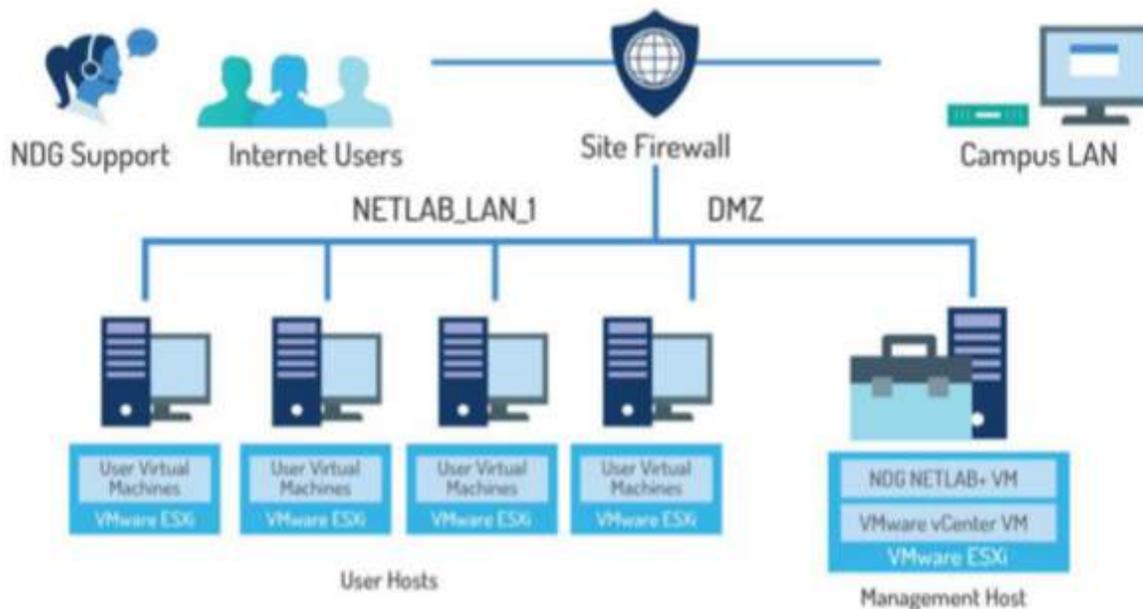
I wanted to get a little bit technical about the background because this is real computing hardware, real systems, powerful systems running in the data center. Ours happens to be at Cabrillo College, a great host for that.

When we chose to send all of our equipment to Cabrillo, when the six colleges agreed to forklift their equipment and send it down there, we knew we had to hire a full-time system administrator. We were so lucky to find David who is on the call today, and he'll be available for questions. He mans this with his student helpers, keeps it running, and has been just a great resource to all of us. He's probably the key to our success, I think.

But you can see that students access it either from campus or, today, as internet users from wherever they're sheltered, and they come in through the site firewall. You know, we're not on the Cabrillo campus network. We're on our own network. We manage it ourselves. Bandwidth is not a problem at all.

CPU
MULTIPLE CORES

GPU
THOUSANDS OF CORES
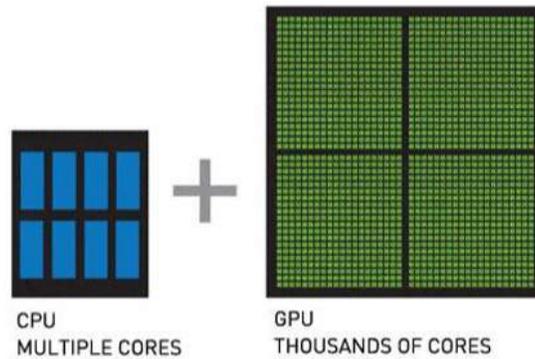
Now, some of the applications we've been asked to look at required better resources. This is all the engineering programs, CAD, SOLIDWORKS – and digital media, too, by the way, like Photoshop. Also, our applications that are graphics intensive… So, you have to have a better computer to be able to run those programs, and that means we have to have better servers on our NETLAB system that support better graphical processing units (GPUs).

So, we've got to buy new hardware to be able to do SOLIDWORKS and AutoCAD and Adobe Photoshop, those programs, so we're in the process of doing that. We should have it set up this summer. David is on that task. He's doing procurement right now.

It basically means we've got to buy more powerful servers. They're double the size and capacity. That one on the top of this image is a two-use server that holds the graphics capabilities to do those graphics applications.
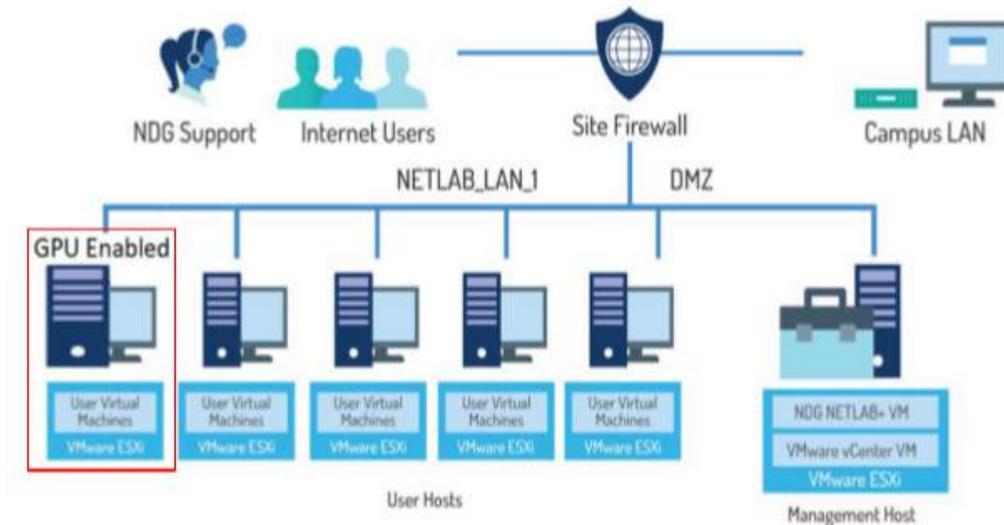
We're going to add that to our existing NETLAB. We'll have that piloted this summer – David, I hope I'm not committing you to too much right now – and then rolling it out in the fall to support our engineering programs that we've been desperate to figure out ways to share.
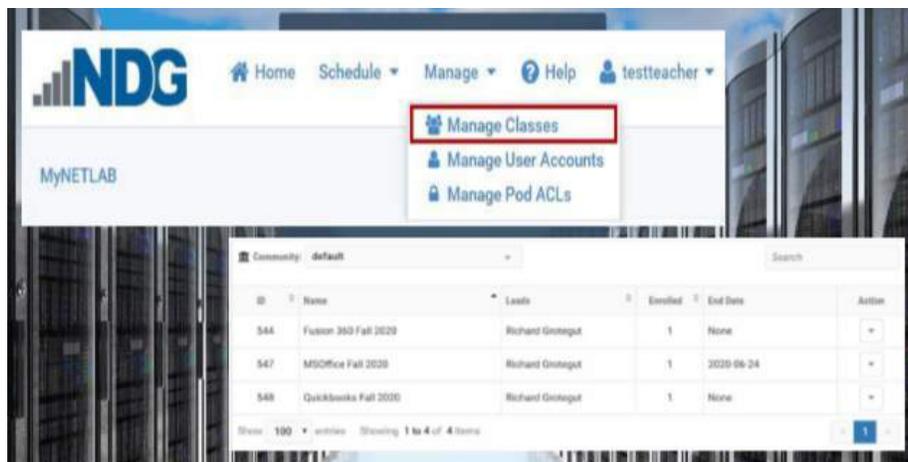
You know, instructors can log on, too. Christina, I don't know if you showed this, that you have a logon account as an instructor. You're part of a community – probably your college. That's the way we divide it up – every college has their own community. They manage their own structures, their

own students, and the lab content that they want to use. Instructors have more options. They can manage the classes, the user accounts, the access control list for the pods – I really want to do that as well – and there are sets of resources available.

In this case, we call them labs or lab content, but they're really access to virtual machines that have applications running on them, so we have Office running on our NETLAB. We have those 10 machines that you can launch and use. Fusion 360 is up there. We've been doing QuickBooks for quite a while, which was of great interest to some of the schools that teach that.

It is a licensed product, so only the college that has a license can use the NETLAB, and you can't just share it with everybody. That's illegal, but they can set it up and have access if they do QuickBooks. That's really been helpful. But typically, with QuickBooks, it's set up in the lab. It's also a lecture computer lab, and they can only use QuickBooks when they have the class scheduled two or three times a week, so we've been able to make that available on our NETLAB as well.

Questions

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BACCC NETLAB website: https://netlab.bayict.cabrillo.edu

RICHARD GROTEGUT: Just very quick, we're moving on it. We're happy to share. We worked with many of the other NETLAB implementations. It's not just up here in northern California, but Coastline College has a pretty intense NETLAB implementation down in Orange County. West LA College with Markus Butler also has a NETLAB implementation that they share.

There's our website. I put David's email address, but he's available, too, to answer any questions today. I think we've left time to do that. Shawn, I'm going to turn it back over to you.

[00:39:06]

STEVE WRIGHT: Shawn, you might want to share the link to the NETLAB User Group, where we archive a lot of prior User Group discussions and any background material. It's helpful to a lot of folks. That would be a good item to share for new people.

SHAWN MONSEN: Absolutely.

STEVE WRIGHT: So, a question I have for Shawn and Christina and Richard is, we may have people on the call who are asking themselves right now, 'OK, what's it take to get up to speed? I have nothing right now. I have classes scheduled for the fall that really need something like this.' What's the timeframe? What are the first steps? What does that look like? Is that even reasonable to think I could have an implementation or access to somebody else's system by Fall?

[00:39:54]

RICHARD GROTEGUT: Yeah, I can answer that question about certain applications. I mean, if they want to use Microsoft Office in a class, they can do that almost immediately. We were faced with that in the Bay area at a couple of the colleges. They had short-term classes that they were running, starting up this past month. In April, we were able to get them up and running with Office.

You know, we have to have the applications. That has to be set up. Obviously, things like SOLIDWORKS and AutoCAD, we don't have those available, but it's just a matter of installing the application on an image and then copying that image and making sure you have the hardware on the NETLAB side to do it as well.

And then get training on how to use the site, and we can certainly provide that. For the NETLAB User Group, there's a lot of resources up there already. And typically, in the summer, during our faculty development weeks, we typically have a NETLAB.

[00:41:00]

STEVE WRIGHT: Let's talk a little bit about money. Whenever something like this happens, when you've got to pay people, things have to happen… You might need equipment. You might need a new circuit or something or whatever. I preface the question with a statement that we have Strong Workforce funds. We have a lot in the regions that have not been used, and there's a real danger of this money being swooped up by the state and put back into regular funds.

So, whatever the rules of engagement are in your region about accessing money. There's going to be probably a short period of time here where, if you've got a project that can help students as a result of the situation, you might want to bring it up. So, I would appreciate from our speakers any idea to how much money someone should consider budgeting to implement this.

[00:41:52]

RICHARD GROTEGUT: Well, I can speak for the Bay area, and all the colleges in the 28 colleges had voted their regional share of Strong Workforce program money to keep NETLAB running and do so every year. So, they all use it for free. They use it for free. Their high school partners do so for free through the articulation with dual enrollment courses.

We do have colleges that have an MOU with our NETLAB system, so they do pay a fee. I think I can share that with you. It's not a lot of money to use it. Right now, we're giving it away at no cost through the summer. We're part of NDG's give-back, so any extra resources we have…

You know, we're nowhere near our capacity to serve either, with our data system. So, we've got a lot of room to grow and add more use, especially with the virtual machines. The Cisco labs are different. The Cisco labs are physical equipment. That's a limit there, but the applications that we're running, we're pretty good with the space, and certainly, anybody that wants to try it out for the summer can probably do that at no charge, and then they'll go from there.

[00:42:24]

SHAWN MONSEN: Steve, each region is different. So, some of the regions do have access to NETLAB resources. Some of the regions have chosen to use other options, like Practice Labs. So, really, the key is getting in contact with your regional representative and find out what region you're in and what resources you have.

[00:43:38]

AUDIENCE MEMBER: I have a couple questions. Christina, I'm assuming that you're using Office 2019?

CHRISTINA OVERMILLER: Yes, we're using the Office 2019 365.

AUDIENCE MEMBER: OK. So, Richard, I was just sort of chatting privately with David, and he has a Windows 10 but an Office 2016 pod? What would it take to get Windows 10 Office 2019 pod?

RICHARD GROTEGUT: Well, you having the right communication with David, I think… Yeah, I think that could be done. I mean, you know, it's… David would be the best to answer that. I think if you can install Office 2019 on your lab computers, you should be able to do it on a NETLAB image as well.

AUDIENCE MEMBER: So, he just needs the volume licensing that we use? Is that what it is? It's this licensing issue?

RICHARD GROTEGUT: Again, I think –

AUDIENCE MEMBER: I'll talk to David.

RICHARD GROTEGUT: Yeah, talk to David. But I thought the colleges all brought in the licenses throughout the region.

AUDIENCE MEMBER: Right, OK.

RICHARD GROTEGUT: So, it covers us.

Nicole Sherman: There's a question in the chat from Angela asking if NETLAB can support programs like Adobe and other programs, maybe like Tax Act?

[00:45:02]

RICHARD GROTEGUT: Yeah, so I can probably answer that. David is here, too. I know we're looking at doing some of the Adobe products, like Photoshop and Illustrator, but anything dealing with video editing is an issue with NETLAB because… David would be better to describe this. You know, NETLAB was designed for the lowest common denominator access for rural areas, so they had to manipulate that refresh rate on video, so it doesn't really work very well for video editing.

However, we are exploring our data center to do what you might be doing in a public cloud, doing it privately – so, setting up environments where they access… It will be in an environment… They just access the machines, and they, consequently, won't be as limited.

Yeah, David is posting in chat. To get those GPU machines to run Adobe products…You know, I'm surprised that Adobe hasn't come forward with something. So many schools teach their products, and I heard through the grapevine that they might be looking at some way of making that available to their education partners. Maybe somebody else has better insight on that. Certainly, any other program, any application you can run on a machine can be run on NETLAB.

[00:46:33]

SHAWN MONSEN: So, the accounting software that she's talking about could be run in that environment if you have the right licenses.

RICHARD GROTEGUT: Probably, yeah. Now, there are some companies that have different language about how their licenses work in the cloud, so that would be something that we would have to address individually.

STEVE WRIGHT: So, the limitations seem to be bandwidth and licensing. What about implementation? I mean, suppose I have something that would meet the criteria for bandwidth and licensing, but I just need to get it put on the server and available. How long does that take?

RICHARD GROTEGUT: David, maybe you could type in and tell exactly that?

STEVE WRIGHT: "It depends on how busy I am," he says. All right, and that's the other thing we're trying to deal with. Throughout the entire state, we can't all be looking at David to implement things, and other people have to do things, too. Just as general advice, we may not get it quantitative here. I am privy to knowledge that there's a concern in the Chancellor's Office that unspent funds that are out there right now will be recalled if you haven't dedicated them.

So, those of you who feel like you have an opportunity or a need to implement something like this, just come up with a number, run it by one of the experts on this call, and submit something and say, "Could you put a hold on X amount of dollars for me to implement this remote laboratory capability because we're going to need it to run classes this fall?"

Get that in, however you do it – email, whatever. I mean, your regional consortiums all have their special way of doing this, but the rules are about to be broken big time, so you need to get the word in.

[00:47:17]

SHAWN MONSEN: So, Steve, if you're in a region that already has a NETLAB environment, those custom labs, depending on the situation, we were able to get our labs spun in a matter of a few days. I think it was three or four days that it took for Jim to get those labs spun up, so it can happen pretty quickly.

STEVE WRIGHT: Yeah, and I think there are some other interesting things brought up today. Christina, I love the way you shared the whole psychological part with the students, and these are not IT students, so we have different layers of training, and that's very interesting as well.

[00:48:59]

RICHARD GROTEGUT: David did respond more. He said he could probably get something up in a week, depending on the application.

STEVE WRIGHT: So, when I talked to you earlier, Richard, I asked pretty much the same question. I think you probably already said the same thing. But if anybody here thinks they need one of these remote capabilities by fall in order to offer a course, there's rime to do it.

RICHARD GROTEGUT: There is.

STEVE WRIGHT: So, you need to get on it, and that's all I've got to say about that. All right, we're doing pretty good. Any other questions? We figured we'd have some how-to questions here. We're ready.

RICHARD GROTEGUT: While people are contemplating their questions, I just wanted to add that NETLAB is a nationally used product. Shawn and I participate as part of a team of instructors all over the U.S. who develop content, and we recognize that that's really the value of NETLAB, is the content that's available. Not just having access but also having a simple way to administer labs and deliver labs as well.

I don't know, Christina, if you're already using embedded labs within NETLAB. Or is this having your students doing their labs from their textbook or something on system.

STEVE WRIGHT: Well, I'm glad you brought that up because there is kind of a back-and-forth discussion about it. Some people like the very simple user fee-based service like Practice Labs. It's easy to implement and get going, but you have the costly fee. Other campuses/faculty/whatever prefer to get more involved in what's there and how it's built and everything else, and that's more your NETLAB kind of candidate.

Early on in this whole discussion, I was much more in favor of the cloud-based pay per seat thing because I thought it was simple. And then I discussed that faculty and the colleges actually like getting involved in this stuff, and I thought, "Wow!" I didn't realize that, so that seems to be part of it.

[00:51:07]

RICHARD GROTEGUT: Yeah. Some do, Steve, but NETLAB can be pretty quick and easy, too, and you can just use a set of labs. There are so many labs already. I mean, in the IT space, we have RedHat, Palo Alto, and VMWare. They already have the labs done. It's really simple for an instructor to get up and running, and it doesn't cost anything.

STEVE WRIGHT: Yeah, there's that group in Chicago. I forgot exactly what it is, but they've been helping develop labs for some time.

RICHARD GROTEGUT: It's all over CSSIA, Florida... Texas has done it through... National Science Foundation has developed content. It is work to do labs, and instructors who teach labs know what it takes to put the lab together and the hours that it takes to do that. And then, if you have to have 20 or 30 labs during the course of a semester, that's a lot of work, so if it's already done, if someone has already done it, we can share it easily. It could be copied from one NETLAB system to another quite simply, and there's a whole catalog with the fellow at CSSIA out in Moraine Valley. They're the repository for most of the NETLAB content.

STEVE WRIGHT: Thank you. Any other comments, contributions, or questions?

AUDIENCE MEMBER: I have a question for Richard. Since Steve has offered that there's money out there… So, I've been playing with AWS Workspaces and the various clients. Two of my issues… One is licensing. You can get a Windows 10 license, no problem. The Office license is a problem, but you can use the volume licensing from your college, and I need to talk to IT with that.

The problem on the back end is that there is, with AWS, sort of an on-demand pricing or a monthly pricing, so I've kind of just been playing with this not in full volume. I set up an Office 2019 Windows 10 image on AWS Workspaces, and I logged in from a Windows machine and a Mac machine. I haven't used it from an iPad yet, but there are various clients that you can have.

So, are you willing to sort of fund my experimentation to expand on this?

STEVE WRIGHT: I think… I hope I didn't misspeak, but the money is already out there. It's called Strong Workforce funds, and a lot of regions have found that they've had a hard time getting it spent internally or within their region, and it hasn't been spent yet.

What I'm talking about is that the government is going to say, "If you haven't spent it yet, I want it back," or, "If it's not committed, I want it back." So, people who have been keeping this money, or regions that have been allowing this money to float while they decide what to do with it are very quickly going to have to decide what to do with it or give it back, so now is the time to bring your alternative and say, "I have a project," but you bring it up with your regional consortium or whomever in your college deals with the regional consortium.

[00:54:11]

RICHARD GROTEGUT: Yeah, actually, Debbie's college has done a really good job using their Strong Workforce program money, so I think… I don't know much about Workspace. I am on a webinar next week on AWS Workspaces to find out more about it and see. I know I've heard through the grapevine there is …. Then I would just have to weigh what that would be compared to NETLAB. With NETLAB, we've already spent the money for that equipment and everything. That's why it turns out to be somewhat of a better short-term solution anyway, always knowing that we would end up going to cloud somehow in the future, but right now, it's just been a quick way to…

AUDIENCE MEMBER: I'll request via email that link to the Workspaces webinar – or is that the Thursday one at LA?

RICHARD GROTEGUT: No, I don't know. This is through San Jose State University. That's somehow special for them. You know, the CSUs are all scrambling, too. They're even a little more… You know, in a different situation than we are as they are very traditional in a lot of the ways that they teach things.

AUDIENCE MEMBER: Yeah, some of the CSUs are using Workspaces and Appstream type stuff, yeah.

STEVE WRIGHT: You know, the thing is we had as many as 56 on here, but we're down to 46 right now, but you all are like the… The folks out there who are talking to the CSUs or to industry or whatever, as you hear of solutions, let us know. We're more than happy to share, put it on our website. This particular webinar will be archived on our website along with any other materials related to it, so if you come up with ideas or alternatives, or if you find partnership opportunities with CSUs or K12s, let us know about them because I think that's going to be the new way of going forward, is collaborating on some of these things.

Any other final comments from our representatives? OK then, we'll wrap it up for today and see you guys next week. We'll be dealing with Nepris and how to do business engagement online. It should be fun! Thank you very much.

CHRISTINA OVERMILLER: Thank you.

RICHARD GROTEGUT: Thanks, everybody. Thanks, Shawn, Steve.