Please stand by for realtime captions. >> Before the session starts and I thought I would ask people, if they don't mind, to move up closer to the front page if I was a professor, the As owner about it right here and the Fs other right there and that last row. The >>

Congratulations. You have made it to this point and you have a little better way to go. This morning's session -- session that we are here for is the Titan Cloud Fullerton implementation. Four introduced the speakers, I want to encourage everyone to fill out the evaluation. They have not told me where the czar, they are on the web is someplace that please go out there and complete the evaluations for not only this session but in the other session you have attended great it is the only way we can improve the conference from year to year. But now onto more important aspect of that is the speaker for today. First I would like to introduce -- Hidalgo the assistant vice president for information technology and infrastructure services at the University of California state, Fullerton is responsible for ensuring successive data center, telecommunications and network infrastructure teams at CSS. He has felt the university since 1998. Initially, as a student assistant, as an IT staff member and now, in his current role and is a member of the faculty, at the CESUF college of business economics teaching -- information systems and sciences and held his MBA from the University of Guam and a Masters of science degree in management science affirmations from CSU Fullerton. The next person I would like to introduce is Chris Menrickez a the associate vice president for information technology, chief technology officer and academic technology officer at Cal State, Fullerton. He oversees operational technology services and enterprise projects, both academic and administrative. He is also a faculty member in the college of business and economics teaching information systems and decision sciences, and in his 16 years the campus, Chris's previous roles include that of director of desktop computing and the help desk, CMS PeopleSoft project, that must have been interesting and interim CIT of any earned both his BA and M.A. in geography at Cal State, Fullerton. And finally, Willie Pen , the assistant director of infrastructure services at Cal State, Fullerton and he is responsible for managing the day-to-day operations of the service infrastructure, telecommunications and network infrastructure teams at Cal State. He has been part of the team since 1997. He must have started when you were 12 or 13. He is now his current role as part of the campus management team. He is also an active participant and a Cal State system wide network of security development and implementation teams and is the former chair of the CSU in CA, the network technology alliance change management group revealed his master's degree from CSS. At this point in time I will turn over the podium to Chris. Spin a you were serious when you said move forward. I know we are doing streaming audio but the last time I was in front of a microphone like this I was bouncing for a concert in high school. I want to go ahead and get started. Thank you for having us and allowing us to make this presentation and hopefully this is as beneficial for you as it has been for us going through this process I am here on behalf of our CIO and he and virtually could not make it this week so I'm here representing him. We will go ahead and get started. Cal State was found in 1957 and the points on the slider basically, most people are located really for -- close to distant land which makes it attractive for some people have 36,000 students by headcount we have a number of different degrees , 103 offered at the campus are the fourth largest campus in the state of California behind UCLA, USC and Berkeley.

We're going to be talking about to emerge and technology trends in her out of the past couple of years and have integrated those two together are campus. We are looking at a mobile strategy as well and say Cloud computing strategy on the campus tied together and what we have been noticing over time is affecting everyone else was, the top 10, this year the previous year, have always included mobile infrastructure and cyber infrastructure that is a key points. Students continue to leave off, and show up on campus, the mobile component becomes larger and larger as a driver for many of us, particularly those of us in the classroom. As it was to this and move forward what we're trying to see in the classroom as business administration. Faculty members standing at the front of the class St. be ready for your quiz and take out your mobile phones to take your quiz.

We have a few faculty that are moving this dynamic educational way, and what we are looking at today, as we have done to facilitate the infrastructure perspective to allow this type of interaction to occur. So are campus we have a call in mobile first strategy and what that is, the stiffer than a web strategy. A strategy is something you develop a new interpreter services on the web. See post webpages and to make it globally available at our mobile strategy is a strategy to set up mobile devices, specifically. We're going to have application set that is made for iPADS, I found an android devices and infrastructure that students are arriving on campus with and the faculty are engaged with. As part of the strategy, Cal State Fullerton has rolled out 1100 iPADS As part of the strategy, Cal State Fullerton has rolled out 1102 fully qualified staff, faculty and administrators on the campus. Leveraging this on classroom as well as on the day-to-day life for things like RTP processes and -- with the virtual Lab. These devices have their own back and associated with it as I said before, which has implications for development. It means we have a development team that is Ground Round development sets that are here with these devices. When her students to technology? We are seeing what they have been putting out over the last two years, more and more students are wanting more of these types of items delivered to their phones and other devices and customized away that is set up for mobile devices. Not so much it is delivered simply from the web and you're trying to resize it and spend most of your day making your index finger and thumb moved back and forth to make the thing to scale properly for you on the screen and the happy though they infrastructure branch around that and on the faculty side of the question you have to receive this, where's my data and of the clouds, what are the clouds? They mean many different things and historically we have not a Cloud to be a main Joan Getman. It has been around for a long time. It has been around since I have been alive but for many of us would have strategy architecture , long-term storage and more recently to host environments we have storage capacities that make it more of an internal campus storage of insensible scale for this conversation turned into something that becomes a greater point of concern when it comes to provisioning and how use the technology. So, at Fullerton, in order to address these ongoing concerns from a sociological in a physical way, how are you handling that? We have something called integrated technology strategy of and what we are trying to do is establish a baseline that says it doesn't matter who you report to, necessarily that we are eliminating silos as part of its infrastructure. But slowly, and infrastructure across the campus and the latter were you or you can leverage the infrastructure. We eliminate the concerns of the silos that IT trying to consolidate everybody. We are concerned about having good services across the entire campus. So this technology strategy is away getting it that I would strategy looks at, I basically the diagram here. It has a whole series of -- circle around the core infrastructure in each one of these areas has a guiding committee that is represented in order to drive the projects and drive the infrastructure investments that we make going forward. On both sides who will see access technology information security because often times those are continuous relationship and also pulling at the resource investments that we make on the campus of the three main points we try to ensure that come across a bit about the project are infrastructure we are dealing with, sustainability, collaboration and visionary. We try to address each one of those three points in every single one of the projects that cuts across each one of these areas. You have RP, access, support and training and working with the campus, we try to get you to a baseline level and variable to provide -- because those are leadership areas that we help push them into our support them in migrating. The governance structure and everything else on the campus there is some voice of governance of Ottawa that we have discovered that we ourselves had to many projects that have gone out and lead have been quite successful that it has taken a long time to get that base level of adoption to occur we have the majority of the campus following along and try to bring those together with the pilots are so leading edge and brought together with the normal adoption curve, Inc. technology governance which basically grafted whole series as well as academic affairs, Council of deans, student affairs, and associated students after an entire government. All of this on our campus lives of two presidents and a ministration and that body is representative of each one of the vice presidents and all this part of our information technology on campus. Taxpayers and infrastructure committee that would solve for this and this committee warlocks takes a look from a scaling perspective, where do we want to go and where the business these requirements that we have an academic needs of actually have on campus for instruction and we was to drive it for research and instruction and the next level, we discuss things, everything for the level of what is the planned out. Of time and all the way into and the demonstration of a virtual computing Lab can't fear going to take over and talk about the remaining components.

Thank you, Chris, for the background and introduction element of our virtual computing strategy for the campus for cloud computing strategy they would set things we can do in using local and private and also we looked at other Cloud computing deployment tools such as the Amazon Cloud and other virtualization strategies we can use for infrastructure, we actually moved from physical -- to hosted appliances and for the virtual computing Lab Department we started to do, we started to use the North Carolina State University model that is part of the Apache computer project. But we did for our campus, we went to SES and we visited them and talk to them about the technology that they wrote up and what capabilities they were able to do and also the type of harbor they were using. Moving from that type of environment, we sent one of our technical staff over to North Carolina State University was the NCSC team and they did a knowledge transfer and taught our technical staff had to get the system going and from there, we were able to set up this environment where we are now serving about 600 virtual nodes using the Apache VCL software. I'm going to hand it off to talk a little bit more about the different sections of our infrastructure and what we are using in our campus to enable students and staff.

Thank you very taking from here, we went to NZ state, we looked at their hardware and said they have all these resources and support from IBM and equipment and totally come back to Fullerton, we said, what can we do to be able to make this happen and at the same time, we are virtualizing our servers so taking her there, the servers have been virtualized and expiring warranty is any thought that, they are still powerful enough that we can make it into a virtual computing Lab so what I did, we have about four -- at the servers and all they need is to add more memory since we are computing our virtual environment, the same approach, Willie did, for some of you that are more technical, start virtualizing our servers at your virtual infrastructure and a little bit more powerful and these servers, have forever he stood, dual core, two socket CPU and Thursday database that handles all these requests and the web handles a request from the user's hand to reference up into something that is more presentable for taught -- we called the Cloud clout they Titan Cloud since we are titans and Sunday are some presentations and this is one of the screenshots when the user logged in and based on the images indicate hand at the rest of the add-ons for applications and some of the other modules. For this particular lab, then you can build your labs and one of the things we did, we incorporated it and -- portal and once the portal is logged in, but actually use the applications for the VCL login. The first login page we can login through local accounts this particular landing page and reservations and whatnot. And the beginning of the class XX emphasis and -- 20 emphasis and every time, you have to wait for provisioning and setting up the communities so that the user can login. For example, there is the library lab that students can reserve. And once the user makes a reservation, they get a status page it says pretty much the same code that we have imported from Apache consortia and haven't made much of the changes as far as the blending page and whatnot they are very efficient and there is no need to make changes. So after a certain time frame, you get the connect button and you get the remote computing IP address and you can login. Of course the username and password is no longer valid because it has timed out. You can try it out, but I don't think it will work. With that connect button, they can get RDP files and get the RDP client and actually have credentials so would you login to the IP address with the right userid and password you still have to type it in because we don't have password to be -- to that background. Is that you get reservation. -- And then you get a reservation. From now on, this is something we did and this is really fresh actually open. How the last few weeks, some of the staff took another project traded to them a while and we started building the BCL format for Macintosh and this is the first. When we visited NZ state last year, Philip at how the environment, how they cover the UNIX is being built and am pretty sure most of your colleges will have some labs of Macintosh and we are thinking, what can we do for Macintosh? So we start building the Mac side and they really put a lot of time and finding the ins and outs of the system and the connectors for Macintosh so we are able to run the Macintosh in the VC in environment. How they put the demonstration on the Macintosh.

-- I will do a quick demonstration on the Macintosh. So the same thing as logging into the VC and environment. I made my current reservations that I can make another one. For example, I will do my reservations here with my basic Mac and it is still in the infant stage, we will do a base image at the base image to the college or the campus and it will get additional images or additional software for classes whether it is accounting or jog or three in the applications you're running they can then give that to the faculty said they could run from it. And here we have the basic OSS. I can create a reservation for a later time frame or create it now and four, six, eight hours or longer. As you can see, I have one those timed out and there's one that was connected and one that was pending.

Question is, this is running in Fullerton? And yes, it is running in Fullerton.

Yes. [Indiscernible comment from the audience. Low audio]

So, let me finish this quickly and will go back to the slide. This is my login page for my Mac. I can do another login. Here's another provision. I will do my connect. One of the things that did it with Macintosh, this particular case, we purchased this license from the [Indiscernible word] amulet to create a Mac connection, will it have a seamless connection so the user can use a single type of remote desktop client from a PC or a Mac. The Macintosh has a remote desktop connection also and from there on, I will type in a password.

[Indiscernible comment from the audience. Low audio]

For the things we need to correct for the operating system does change the background image because whenever a user logs in, takes a while to load because of the background image.

It is a refresh that takes a while. Usually, an ABC ended Bierman, -- usually in a environment, remote locations, every good of the background you can reuse into a plain environment -- processed so, a two display with it is,

Is a virtual environment set up with availability?

Is a set of those high availability, the Center for virtual environment is, since they are reusing all this hardware, all of this hardware is individual hardware and is bringing into it the single -- and the VCN, if this is upward, it is not, from a host standpoint and each host can -- it depends on what kind of images you are loading and I were going to take this off-line and pre-provisioned my notes from someplace else. So, every time I log into a system, how to look at the system monitoring schedules they shown Sam you can see, -- and you will see it is not from a remote locking standpoint, it is not that bad and here is a system of Amico back and I will find -- I will show you the Mac site.

A so as you Conseco this particular Mac, is a virtualized Mac. Then running at 2.6 gig memory. Any physical Macintosh, here is a demonstration of the Macintosh. From the I-Wrap software itself you can also -- your audio or video's from the PC.

The question was, how many current sessions we have? Schema for this particular instance, are running a first generation it is a dual core socket 2.68 CPU will to make this as user experience as possible so it only made it in three instances out of this Mac Pro.

No. It is not. One of the other reasons, one is to increase user experience and decide that particular Macintosh for certain applications, who went to be able to give applications that are usable than running memory and applications requires more than the sites require.

We actually purchased licenses for regions that we created so we are creating the licensing scheme that Apple has made available. The

[Indiscernible comment from the audience. Low audio]

Can you repeat that question?

[Indiscernible comment from the audience. Low audio]

If I can rephrase your question, Apple is wary of using hardware virtualization schemes. We are actually working with Apple on this and they are aware of what we're doing and where we are trying to go with the model and they are partnering with us because most of the campuses we have spoken to, there are pockets on the campus, all of the art schools are heavily Mac driven and they can't participate in the program on the Windows side today that he applications but until you go back, they can't go virtual Apple's understanding of that who we are working with them on the licensing and the hardware configurations and as of yet, what you're saying, is historically true, yes, but they are working on part of this project. Soon it they are talking with us and what Fullerton has done this particular project has purchased enough licenses we are covering ourselves that way as part of the project and Apple is working with us as part of the project. The

Apple's license, back in the -- you could run a virtualized systems on the server OS and you can only run on the Mac hardware. Since the lion came out, the lion, you can read on OS in a virtualized environment and I think they just came out for that. Soon it would require some changes on our part and we don't have that at this point in time.

I have a question from an online participant. What are the RDP software you using to connect to Mac servers? CNet we're using code rebel graphed RDP server. >> Going back to the hardware, these are all overused to Mac pros, I think they are probably three or four years old. And we are running on the Mac server, the snow leopard -- you can see, we have an upgrade on a PowerPoint, so we can use the same RDP client for both Windows and Macintosh users. And it is still running development on Apache and we are going to donate it back to the VCO Consortium. The

Here is our very little Mac lab the VCO. As you can see, we stacked them up into a rack. We don't have a lot of surf, this will meet our needs for experimental use. So she can see, about 15 of them experimental Mac lab. The these are a couple of more OSx screenshot. The

In our tribute to Steve jobs, let us say one more thing, the code we use for the Mac OS 10 provision in peace for the Apache project, we are working on contributing it to the computer project of any tab or campus contacts appear with the department complete the license agreement and it is actually going to be made available within the Apache for the rest of you to download for your use and experimentation. That is what we have. We could take questions now. The

You talked about the Apple licensing, how about licensing further software projects of us have easily virtualized --

There are no slides about software licensing. But we have been doing, on an individualized basis, talking with each company, as you know, you're having the same conversations that I am, that I have the same perspectives about virtualization across so in some cases we have been able to say the way we are used to get, on the virtual lab, it is catchier campus license on a campus server on a campus server box and some say you are covered another say this is a virtualized incident and we want to remain that instant, that is a separate version of the software so there is still no consistent story was nothing but working our way through the process of trying to get people to come to some common issue with data warehousing implementation for the governor North Carolina is something that really further drive the conversation. This event very good question.

I want to add to the discussion on licensing, a constituent group on software licensing, we were there this morning and there was a big discussion on licensing in a Cloud environment and trying to get the high end to work together with the reasonably coordinated voice about the problems and benefits for us and the vendors being reasonable and having Cloud licensing so I hope everyone will take a look at that group to go in as an active listserv.

I can say that -- is more than happy to participate in this. We view that as something that is key and necessary for projects and another thing. I slides, I don't know if you'll post them at the resources section.

That would be great.

Henry Schaefer, he was actually very instrumental in implementing this project and North Carolina State University hosted myself and a few members of our team and Todd exfoliated to know about the virtual computer lab and we thought his team, we would not be where we are at without the virtual computing Lab.

Thank you.

Let me ask a provocative question, I noticed, Chris, you showed your group in there. I think this type of virtualization has been promised to be used in ERP environment as well as the academic environment. We haven't gotten very far put not for technical reasons, for cultural reasons. How far have you gotten?

The way that the environment is set up within the CSU system, it is centralized all the way up so we don't have much control over individualized boxes or presentation other than working on test boxes or pre-releases. Most of that conversation has begun and on our campus dialogues are capable of having it, we are making good headway and there is a lot of interest but it is out of our hands at this point.

The question off-center. You should slides about server backend and all that stuff, how are you doing in virtualizing desktops and environments and mobile computing and delivering images to mobile computing, what about your labs and --

Okay. We are delivering images to our labs. We have a general open lab and on top of this is a selection choice or images themselves were when you login, you are walking into a virtual lab. Our next step is starting to look at a desktop day-to-day and one of the concerns we have the likes of maturity in the way the images are built because you can see that building pockets of specialization across campus, which you get the images to Alton, your finance area does not work the same as your anthropology department and images that may occur in those particular places may vary from one to the other that goes back to the licensing conversation to mediate those areas and it's something we're very interested in going forward and something a little further down for us.

You're talking about using RDP, none of that community, and their expectations as far as performance is concerned, surrounding activity, the ultimate goal, you might want to keep the performance high. We have a virtualized environment that we played around with some RDP deployment to know you found it does not have performance needs, not today, that require today how interactive application I mean, obviously, we are far away from the center and there is a delay, as a performance that are on campus or are you looking at other technologies and other technologies and desktops and something on the back? The

We did some experiments with several different open sources and software and so far, I want to say we are still premature as far as pointing out what is optimized and in this case, one of the approaches we are trying to accomplish, this didn't make a single remote desktop client but definitely, we question a lot of input from the community to find out what works and what we can optimize the thank you very much for the input.

I think that is one of the questions we got when people heard we were experimenting they said, were you able to get final -- and we said no, --

With the applications, and for the Department of geography and we are attempting to run GIS. You can run GIS and for this, everything else is going to be okay. That is what we are using as our benchmark rate and when you see another presentation, saying that GIS works, I don't think any of your application is going to have a problem. We don't fully understand what you're saying because we have experienced it.

Are you planning to provide [Indiscernible comment from the audience. Low audio] each PC, for example.

The question is, I would like to provide HPC. A

Like Amazon does, for example, what are your plans to provide this?

I will take that. Some of the presentations we have done previously were looking at extending this once we go beyond what we consider high range pilot have you extend this out from there, Toledo to it at this moment -- we got an Amazon type TranV so it is agnostic to the center and one of the issues that we encounter, those who have been doing virtual longer than we have, you build a specific image and you lock yourself into a vendor title are looking to go towards the agnostic type of image build, something playing an Amazon or IBM or any others here. -- Any other sphere.

One of the things I want to circle back on the license, you cannot actually turn on how the instances of a particular session, so, for example, if you have a license for a particular software company, you can specify that session to only run 40 instances.

[Indiscernible comment from the audience. Low audio] Server applications licenses won't explicitly allow virtualization.

Vendors are changing their specifics on the initiatives of the drop down, we have had CSS running is to include capable from a licensing perspective so what is happening, we are experiencing some virtual programming and licenses and some of the software companies, in some ways, it does technically work so how can I get this done and we are hoping to push with some of the so they are way ahead of us in this game because they've been having conversations for a couple of years and I can see you're definitely turning the boat but that is a conversation to have with the vendors to suit the software does work. Apple had the same conversation point and we were not written for that are able to technically prove, but for promised to see how to make it happen.

My timer is lacking me. Five minutes left. Any other questions?

Can you talk about management tools to use for virtualization and had exposure to VM Ware, [Indiscernible comment from the audience. Low audio].

The backend of the host, visions of being more DX excise. The management tool from the Apache consortium that we download, the management tool, as you can see, from the bottom piece, the bottom centerpiece, it breaks down into 3% -- parts, management, database and Web and the management manages the host. Also the guests. There quite a few database network infrastructures to be set up so there are some backend to have to manage from the private baseline seat can -- systems initiate a session login from a backend wing over through the SS age connections to UNIX or Linux to create a user account. So the user is just logging into the website based on whatever credentials are trying to let the user connect to you. You can create sessions are generated sessions and the database is just images and also sessions but the user logs in to you. >> After another questions, thank you very much for having us. And if you want to send an e-mail who happily participate.

We are providing the Department of the presentation of the website with our presentation today.

Thank you.

[Applause] >>

[Event concluded]