Systemwide Architecture Committee Meeting

Thursday April 3, 2018

Online 1:30 to 3pm

Tim Calhoon: Well, while the topic is hot. First, let me let me take roll real quick and then let's jump into system wide offering and things like that, what we can do to help the college's.

Tim Calhoon: Barney might join us in the meeting and I talked to him earlier today. I saw Gary Bird, Gary, you're here right? Tim is here, Paul Bishop is here. Bob Hughes are you on the phone? Jorge Mata, JC or Jorge from the foundation Joe Moreau, I saw Joe, Joe?

Joe Moreau: Yep.

Tim Calhoon: Dan, Dan are you on?

Dan Watkins: Yes.

Tim Calhoon: You are recording the meeting, right Bruce?

Bruce Racheter: Yes.

Tim Calhoon: Okay. Amir? Are you on?

Amir Khan: Yes, of course.

Tim Calhoon: Okay, great. Sylvia. I thought I saw Sylia. Okay, Sylvia is here.

Tim Calhoon: Russell are you with us? Candace?

Candace Jones: Here.

Tim Calhoon: All right, Lou, Gary Moser.

Gary Moser: Here.

Tim Calhoon: Alright, Joe Perret. Joe’s here. Alright, Michael Dioquino.

Michael Dioquino: Here.

Tim Calhoon: All right. And do we have any guests on the call? Anyone else on the call?

Glen Profeta: This is Glen Profeta. I'm just kind of a fly on the wall. I want to hear the conversation. I heard that we might be talking a little bit about maybe app streaming today and some virtual desktops and things like that.

Tim Calhoon: Yeah. Welcome, feel free to feel free to jump in. Yeah, so we're talking about bandwidth. So I just want to raise the topic we brought up. I brought up earlier in the week that was this concept of CENIC has asked the network members if it was possible to leave their wifis open with a guest access. I know some colleges do that and others don't. And I think it sounds to me like it's really all over the place, right, I mean, that's what it sounds like. From what I've been able to tell.

Tim Calhoon: Does that kind of jive with what everyone's experience is? I mean, Paul, do you guys have open Wifi on your campus?

Paul Bishop: We have guest access they have to put in their email address and then they get emailed their password.

Tim Calhoon: Yeah, you have guest access Glen?

Glen Profeta: Just students are allowed to log into our public Wi Fi.

Tim Calhoon: Okay. All right. And Gary, I think you said you don't have guest access right?

Gary Moser: We do have Guest Access, but there's absolutely very little bleed over outside of inside. We were just starting our outdoor Wi Fi project at the colleges and then this hit. We're not even ready. And then on top of that our largest college is under major construction. So, there's going to be very limited access for safety reasons.

Tim Calhoon: You know, the idea here is that, that there are you know in low income rural whatever you know folks don't have internet access and it might be a way for people to come and be either be nearby the campus or park in a parking lot or something and be able to get on the internet to and I know it's kind of a, it's a, it really is a very individualized, in my mind, a very individualized local kind of thing as to whether somebody would do that or not. And whether you know it would be an offering the campus would want to make. But I think the Chancellor's Office is going to put out a survey, if they haven't already, to kind of try to survey this issue. To see if colleges will be interested in doing that as a public service. It goes along with the Civic Center act, you know, that basically designates community colleges as civic centers and that you know we're supposed to, to allow our, our, our facilities to be used by the public. You know, in a reasonably controlled fashion. So anyway, um, Any other areas that maybe we talked. I know online, we talked about, you know, like bathrooms would be an issue. The police force might not be happy with people sitting around a parking lot. You know those were all. Any other kinds of issues? Does anybody see a big security issue having a guest network, other than just, you know, someone coming in and using the network to, you know, for nefarious purposes?

Gary Moser: I think all those Tim, I think those are all a possibility. It just depends on the risk level that that wants to be accepted, whatever that may be.

Tim Calhoon: Yeah, it’s really a risk benefit for that community is really what it comes down to, in my mind. Okay, so.

Daniel Watkins: Well I think a large issue is how many colleges have outdoor wifi right? And how close do people need to be to buildings. I think with Glenn there’s a lot of colleges that haven’t pushed WiFi out to large outdoor areas.

Tim Calhoon: Yeah, I mean, does anybody on the phone not have outdoor Wi Fi?

Gary Moser: I wouldn't say anything tangible. I mean, it's if you happen to be standing next to a building and you catch a bleed over that's where it's at.

Tim Calhoon: Okay,.

Paul Bishop: I think the better question. Tim, is how many people have outdoor access points.

Tim Calhoon: Yeah, yeah.

Glen Profeta: We have just a few, but we don't have any intentionally in like parking lots.

Joseph Perret: I know there's some kind of federal regulations that have to do with people doing nefarious things. And yet. We also noticed that places like McDonald's nationwide. Doesn't require any kind of login when you go there. I'm wondering if they are capturing the MAC address and tie that just in case something goes wrong?

Tim Calhoon: Yeah, I

Joseph Moreau: I don't know that we really know what they're doing, but they are subject to very intrusive rules by the government if they don’t secure it. So, I mean, I think, typically Higher Ed's position is we don't want anybody from law enforcement in our business. So that's why we generally lock it down.

Gary Moser: And another piece of this, Tim, I’ll bring a point, is the support logistics behind it, what's the expectation on support? When Billy can’t get his four year old laptop to login, who’s he gonna call and how much are we responsive to that and are we responsive to that? So I think that's another component

Tim Calhoon: Yeah.

Joseph Perret: I mean, that shouldn’t be our driving force, obviously we're doing something for free, that maybe they can access and that’s just the way it is, but I think going back to the issue of and my campus is really an issue of wide access where we get guests coming on campus for conferences or whatever else. And then you know you got to get the IT department to set up a special password and get that password, because I'm in the meeting, maybe called in a short time. And I just think it needs to be a lot more accessible than it is. Yeah.

Gary Moser: One other point I'd like to do is if this were to go forward, it does go forward. And I remember experiencing a little bit of this planning at Butte way back in, 2006 or 2007 during the first evacuation scenario because of fires. But one of the things that we would look at is how much do we want to throttle various types of traffic and when I'm thinking do we want Billy just coming and sitting in the parking lot, watching Netflix and sucking down bandwidth and multiply that by 50,000 people.

Tim Calhoon: Yeah. Okay, I want to, I want to ask. So, have you thought about other system wide offerings that we could make other things that we could do things that we can pass on to Barney and the other vice chancellors of what we could do to help.

Paul Bishop: System wide discount on mobile hotspots. You know, if you go to College Buy they've got one, but they only have I think they only have 50 that are available.

Tim Calhoon: What?!

Glen Profeta: Right, I think the local or the hotspots is a good idea, except for, I think, Gary, you and I still have a problem in rural areas where we don't have good cellular service, so it doesn't really help us all that much.

Gary Moser: Spot on. Glen, spot on. And we experienced that a lot, especially on our eastern campus in Ridgecrest, Cerro Coso college is all remote they go to Bishop and mammoth and there's. I mean, there's lots of desert there.

Glen Profeta: Yeah, I'm trying to reign that back because they think that's the answer to all this right now is like just just give them hotspots and it's not the answer, necessarily.

Gary Moser: And satellite phones are kind of expensive.

Glen Profeta: Haha. Yeah.

Joseph Perret: One of the things you guys Probably have seen on the news is our college is giving away, to students, Android laptops.

Gary Moser: Gifting them public funds. Awesome. Hahaha.

Joseph Perret: And then, that again, offers us a pathway, perhaps, to get to the point where all of our students have access to that kind of laptop. We can change how we teach, as a result. So it's something to think about.

Joseph Moreau: So one of the things that Barney had asked about was this Neverware CloudReady thing that's kind of an opensource version of the Chrome OS that you can put on almost any box that may not be able to be updated to the most current OS. I tried it and didn't have a lot of luck with it. I don't know if anyone else has poked around with that.

Tim Calhoon: Yeah, you know, Chrome OS is getting updated like every two weeks to a month, you know, and it's always and Neverware is always like, about two versions back, I think. So, it sounds like it's way out of date or something, but it's just slightly out of date.

Paul Bishop: I think I tried it two years ago and my experience was the same as Joseph is like, Well, that was a lot of wasted effort, you know, because it was a dog and and you turn a laptop that was a dog to begin with into a just a different dog, so.

Tim Calhoon: Really? Wow. I would have thought the lightweight operating system would have worked better but no.

Gary Moser: You know I want to look at this from a different angle. I mean, I applaud the attempt at what was trying to do and we utilize the old laptops and put something clean on them, but I look at the whole support logistics supply chain behind that and the hit and miss that, depending on the device. I say, if we want to do this. Let's put the money together and give the students a voucher and Staples has a Chromebook 150 bucks right now. I mean, it'd be so much easier to just say here, go buy it and have a nice day instead of us having to worry about support, whether it works, all that stuff. It's not cost effective.

Paul Bishop: We're having that battle on campus right now, Gary, where we're in this big discussion about should we just give the students a voucher for I get students $200 from the foundation to go and update their technology, whatever they need to do. First, you know, we're looking at buying from Sprint 2000 hotspots that come with a Chromebook as well.

Gary Moser: Well, keep in mind Sprint's hotspots and cell service is spotty, so you're not helping me at all Paul.

Paul Bishop: Well there's no help for you out there in the boonies, right?

Gary Moser: I understand and I fully agree, but I'm just saying, you know. And speaking of the foundation, if the system foundation would work with, you know, a Chromebook vendor and get bulk price. I bet that price would even come down farther.

Paul Bishop: Well, they do have one and it's with Spring and it's you know $80 for the device and then $20 a month thereafter. But they've got 50.

Tim Calhoon: Paul when you say "50", what do you mean "they've got 50?"

Paul Bishop: Yeah, that's all they got in stock. We just asked them for a quote, they said they can only quote us on 50, that's what they had.

Joseph Moreau: I'm actually running. I'm actually running on one of those hotspots right now because we have no wired infrastructure in my neighborhood in the Santa Cruz Mountains, it's five megabits down and one megabit up, it works, mostly pretty good, but it's subject to atmospheric conditions.

Joseph Perret: Sprint doesn't work anywhere on our campus, we're sitting in a cyber hole and we're in an urban area.
Paul Bishop: Well that's why the voucher idea probably is the best one because the students could buy the technology that works where they live.

Gary Moser: Exactly.

Paul Bishop: Instead of trying to buy one from Sprint or AT&T or Verizon and one size fits all doesn't work.

Tim Calhoon: So, um, are there any

Daniel Watkins: They'll stick need advice on what to buy

Paul Bishop: Of course they might spend the money on food, who knows.

Tim Calhoon: Are there. I'm wondering, you know, with this federal money coming from colleges, if that could be something that was repurposed for students. I don't know, you knew for buying.

Joseph Moreau: I've been in, Educause had partnered with ACE to provide some input to Congress on what that package might look like. And so of course you know it's not as large as we had asked for. And I thought what we asked for was pretty modest, to be frank. But it'd still be significant, but probably what will happen is that that money will be doled out to the States as a block grant and then each state will have to decide how they want to spread that to colleges and universities, so. Some of it. We had asked specifically to be allotted for student technology support, but I think it's probably getting all lumped into one big check.

Tim Calhoon: Okay. So what about like add on to, you know, things for teaching and learning add ons for Canvas, etc, etc. I mean, are you seeing, you know, Joe. and Joseph. Joe and Joe or anybody you know are you seeing, you know, faculty asking for specific types of programs. You know what we are seeing there that could be helped out with the model.

Joseph Perret: At our college. We have just almost everything. Wendy has been really proactive in that and being part of the consortium. She's had access to things, so we have a whole bunch of add ons to help our campus and help our faculty, but, you know, the majority of them just use the simple straightforward stuff. And now that we're all doing it remotely everybody's on zoom and I think integrating zoom with Canvas is just a very good idea. So the students have one place to go and you can have one set of instructions and they know what to do.

Tim Calhoon: Yeah.

Joseph Moreau: The biggest thing that I think between what CBC OEI has provided and what individual colleges like Joe's and others have done in terms of acquiring their own add ons an awful lot of bases are covered. The one that seems to be the biggest gap, and I know Barney's already trying to get behind this is around simulated labs. So looking at platforms like Labster or

SimBio or there are others and depending on you know what your pedagogical approaches you may like one over the other. And I think he's got a couple of colleges, he Barney, has got a couple of colleges that are doing, you know, some essentially proof of concept with things like Labster to give them to give the chancellor's office feedback as to whether they want to fund that whole system. But yeah, it's probably the biggest gap, I think, is in lab simulation.

Daniel Watkins: One. I've heard across all three of our campuses, Ventura, is a need for Canvas studio so I'm actually reaching out to Instructure and trying to get a quote for the three colleges to do a district wide but Canvas Studio is kind of like Camtasia built in video editing and closed captioning for courses for online courses and as instructors do videos and video instruction. It's just a critical tool and we've got some Camtasia spread out, but that's built right in the canvas and it's super easy for faculty to use. So that's been our biggest ask.

Tim Calhoon: And is accessibility built into it? That's the key, you know, a key point because you don't want to make videos and not have it be accessible.

Daniel Watkins: It is, yeah. We're doing an accessibility training too but it does have all the accessibility features that we have in Canvas. We also have Ally and I heard that. I think I heard that the state's going to pay for Ally for colleges that don't have it, for six months.
Tim Calhoon: Yeah yeah

Tim Calhoon: (unknown) My license for that, I believe.

Joseph Moreau: It's going to be at least for six months we have, we meaning CBC, has asked the chancellor's office to fund it through June of 2021 and they are very open to that, but they haven't made a commitment until they decide how they're going to pay the bill.

Daniel Watkins: Yeah, and that's for all the colleges Joe?

Joseph Moreau: That's for every college. So, I believe that anybody who already has an existing contract, that contract would be subsumed under the new system contract. So, yeah, that's a done deal.

Tim Calhoon: Hey Joe, would you take up the banner to talk with Barney about Canvas Studio?

Joseph Moreau: I will. Yeah. And I actually was just doing that on the side here.
Tim Calhoon: Thank you.

Joseph Perret: The two issues that the new faculty, the faculty who haven't been teaching online have brought up and are trying to get a grasp on. One is whatever we have for the TurnItIn equivalent, and I believe we have something and we're using it on our campus. And the other one is many are concerned about testing authentication so that they know the right people are taking the test. It isn't a big deal to me but it is to them.

Joseph Moreau: We just extended the Proctorio license to all colleges, just like Ally. So that's available to everyone.

Joseph Perret: Wasn't there some talk about it going away, Joe?

Joseph Moreau: There, there was there was, you know, as you know, as, as more colleges are joining the consortium and we're not necessarily getting any more money from the state, you know, we worked with the consortium to say, well, you know, we can't continue to fund everything and so it seemed like the least popular in terms of adoption of the of the consortium based products that we funded centrally was Proctorio. Plus, they were becoming a little difficult to work with, to be frank. And they were getting a little crazy with their pricing so we had originally told people that we were going to maintain the contract, but we would not fund it centrally effective July one. But then when all this stuff happened they came back to the table and said okay, maybe we could be nicer and we could give you a better price.

Daniel Watkins: Now if we can get Hoskins [?] we can do same thing

Gary Moser: Oh dare to dream, Dan.

Joseph Moreau: Yeah, there you go. But Proctorio is available to all colleges.

Tim Calhoon: So I was, I was gonna mention it. And we've got Amir on the phone.This on a different tack Amir has put together a white paper for college IT with resources and advice on helping faculty and staff, especially who staff are working with TII and things like that work safely from home, you know, our practice good security practices at home, get information security training and that sort of thing. If that went out is that something that the IT departments would use to get out to the faculty and staff?

Daniel Watkins: I think it would be good to supplement what we already have. Because we've all been doing it I think.

Tim Calhoon: Okay.

Gary Moser: No, and then maybe put it on the website so people can pull as needed instead of a distribution path, that might be helpful as well.
Tim Calhoon: Yeah, will do, will do. We'll have it available at the Information Security Center website, and then we'll probably send out an email on the CISO Listserv and if people want to take a look, they can click on it and get to it.

Amir Khan: Just to add to the telly working document. We also encourage, in that document, to work with the internal security team or IT team to, you know, the district or a college so.

Tim Calhoon: Yeah, it's really your, your practice. I mean, we're just trying to give you resources right is really what therefore. All right, well, other things besides, you know, basic, you know, I mean, nobody. I never heard anybody say anything about printers.

Gary Moser: It's called esign Tim. It's called esign. So, the other thing is, and Tim I'm not trying to pour salt on a wound but you know the CENIC load would be really good to know where we're at and monitor and get some updates going.

Tim Calhoon: Yeah, I asked Michael to do some comparisons. I don't think we're seeing, I think it only makes sense that the CENIC load is going to go way down, you know, nobody can get this right, so, so I think I don't think we're gonna have a problem. All of ours.

Tim Calhoon: All of our all of ours, but I'm looking at it.

Gary Moser: But I'm looking at it, why waste a good crisis when you might have an opportunity to shine a light on it.

Tim Calhoon: No, I'm with you. I'm asking Barney to use this to get more help, let's not waste a crisis. We need the funding.

Gary Moser: And then I have another question. People already may know the answer, but I don't. So my understanding is Zoom provides the ability to do webinars and I'd like to know what the licensing is or the access is on that. Am I wrong on that or am I right on that?

Tim Calhoon: No, you're right. There's two things that I found out, there's the webinars. You can also broadcast your meetings to YouTube in new fashion and Rico is going to be coming out with instructions on how to do that, I think probably this week or next week.

Gary Moser: Perfect, that would be very helpful because I don't know how to do it and I've been asked.

Joseph Moreau: It's really easy. Gary, we're doing a couple of them, our folks got it together and did all the testing and connectivity and in a couple of hours, it was done and it doesn't cost anything more.

Gary Moser: Right. So Joe, if you could send me a contact. I'd like to talk to somebody, if I could.

Joseph Moreau: Absolutely.

Gary Moser: Thank you, sir.

Tim Calhoon: All right. Hey, I think our colleagues with AWS have joined us so, Heather, are you on?

Gary Moser: You gotta be patient with the AWS folks, they only know how to spell chime. Sorry, Heather.

Tim Calhoon: Oh, there's Heather

Ben Trunnell (AWS): This is Ben with Amazon Web Services (AWS), I'm here. It looks like Heather is also here.

Tim Calhoon: Heather you have to unmute.

Heather Stratton (AWS): I heard that Gary and I see you, I see you.

Gary Moser: I know, that's going to cost me, I know.

Heather Stratton (AWS): No, it's okay. I like Zoom better, honestly. But, don't tell Amazon

Tim Calhoon: This meeting is being recorded, Heather.

Tim Calhoon: Because for you, your

Heather Stratton (AWS): Dang it, dang it. It's just a personal preference.

Tim Calhoon: I think we're going to get a really good discount from Amazon. From now on,

Heather Stratton (AWS): Just going straight for it. Just gonna go right after me, okay. Alright well, I think I've got my folks here, so.

Tim Calhoon: Okay. Well, Dan Watkins had the great idea to invite you guys to the meeting to kind of talk to us about what Amazon has for workspaces, and for App Streaming kind of refresh or not. For me, it would be a refresher. It's been a while since I've looked into that and I'm sure there are a lot of new offerings and things going on there. But definitely something that's relevant right now for our system. So it makes for good sense. Okay, so, yeah, Heather, take it away.

Heather Stratton (AWS): Okay, so I just want to make sure that I introduce the AWS folks that are on the team. So if you want to just do a quick intro, you guys. Ben, go ahead and start.

Ben Trunnell (AWS): Sure, hi guys. So those of you who don't know me, I'm Ben Trunnell solutions architect with AWS. Prior to joining AWS, about a year ago, I was with Cal Poly San Luis Obispo where I helped lead their Cloud transformation and really pretty much my whole IT career has been in the public sector, prior to AWS, so I'm pretty familiar with the public sector.

Heather Stratton (AWS): Thanks, Ben. Andrew, you want to go ahead?

Andrew DeFoe (AWS): Can you hear me?

Heather Stratton (AWS): Yeah. Gotcha. Yeah.

Andrew DeFoe (AWS): All right. Hey, good afternoon, Andrew DeFoe, Business Development Manager for AWS and worldwide public sector focusing on our end user computing suite of services. I've been with AWS for about, actually it was five years on Monday.

Heather Stratton (AWS): And Marshall. Are you out there?

Marshall: I am, hey everybody. Marshall Thompson, been with AWS for six years and a part of the account team with Heather. Thanks.

Heather Stratton (AWS): Awesome. And then we also had John Apiz from our team join too. John?

John Apiz (AWS): Hi, yes, my name is John Apiz. I'm a solutions architect. I've been with Amazon for about a year and before that I worked at the University of California, Irvine. So also experienced with the school systems.

Heather Stratton (AWS): Awesome. Great. Thank you. Yeah, thanks for that. So you have a dedicated account team. I think many of you know that from us. And then, Andrew is our Business Development Manager for end user compute and for the worldwide public sector. So I wanted to and for state local government, I should say and education. So I wanted to have him on the call also. So as we talk about things and we think about sort of scale and things that are going on. I think he's a great resource for us and I want to utilize him as the conversation goes along, and then also because of Covid-19 so many things have been going on that he can share some perspective across the state at the you know the state governments, local cities, all of those things. So I wanted to have him join us. And before we start, I thought, what I would do was just to ask and make sure. I mean, I know you wanted to hear about AppStream and then workspaces. And you know that we've been doing some work out there obviously with Ventura and College of the Sequoias and a number of others, but I wouldn't mind hearing from all of you, or just from some of you that want to chime in on what's the immediate priority, what is it that you need. Now, I know it's you know obviously, we've been talking a lot With folks about the remote worker, that's been the immediate need coming up that's come up first and then staff and then students. And then maybe you know that's not in any particular order. But that's just how things have come up as we've been engaged with the CC's. And so I thought I would hear from you today what we should be thinking about and focused on for you. So we're covering your needs when we're on this call. So does anyone non-AWS want to respond to that?

Candace Jones: I'll pipe up, Candace from Pasadena.

Heather Stratton (AWS): Hi Candace!

Candace Jones: Hi Heather! So we're actually going to be for students are our focus because we've kind of have our faculty and staff covered. And so, right now I think we have all the Word Microsoft Products, QuickBooks, and AutoCAD for student consumption and we're just working with your team on how to get those all on one dashboard. So we're not sending out individual links to the respective applications that have been installed there. So for us, it's student usage that's our focus because it's something that we don't have a real answer for.

Heather Stratton (AWS): Great, thanks. Candace

Gary Moser: And Heather, I would say that whatever you can do to help in return in terms of dealing with rural environments because of bandwidth limitations, accessibility limitations from providers, those types of things. What kind of a footprint or what kind of aid can we provide our students and even in my case remote workforce that we have to those limitations on just the connectivity levels and bandwidth levels that we have out in the sticks?

Heather Stratton (AWS): Okay. That's great. Thanks, Gary.

Gary Moser: And then of course I'll throw something else in there, too. I know you guys work really hard on the pricing and I really appreciate that. However, we have such a wide disparity between colleges in terms of size and resource for a variety of factors and a variety of locations that understanding more about how that could come into play, per se, a smaller college as opposed to somebody maybe current size. and because there's different resource levels, different technical capabilities within and how much of that can be involved too. And again, I hate this word in technology, but what kind of a plug and play environment.

Daniel Watkins: Yeah, I'm wondering, Heather too on how we can do things for the statewide students as a system, you know, as a whole, not just individual colleges, but are there ways in which you know the tech center can work with your team to launch something that gives every student, you know, equitable access to, you know, resources or tools or applications that they all need to use to succeed.

Heather Stratton (AWS): Okay, that's a great question. Okay. Yeah. Thanks, Dan. Anything else? I mean there probably are, and I encourage questions as we go along, but anything else?

Tim Calhoon: Heather I'd like to basically understand the different types of operating systems that are available and what their capabilities are for workspaces.

Heather Stratton (AWS): Okay, we'll talk about that. Okay so, actually, let me back up on that on the workspaces. For staff or students?

Gary Moser: Yes.

Tim Calhoon: Both, yeah.

Heather Stratton (AWS): What was that? Sorry. Last thing.

Tim Calhoon: Both, I think.

Heather Stratton (AWS): Okay, both, alright. Alright, so I think that let's go ahead and dive in here. We're going to hit on all of the things that you said as we go along and we will talk about the statewide and Dan, I had a conversation with Andrew, actually. And we've been thinking about this, you know, ever since, you know, if you were looking at this from a statewide perspective and how you would roll out you know how, what would that look like. I think what we've learned is that in working with just, you know, as we've we've scaled up with, you know, conversations and then also deployed, you know, a few schools. Right? So six different

institutions we work with, we know and you know that everyone is sort of set up differently and so the approach is a little bit different I think. I think when we're talking about how do we scale that out then there is sort of this approach that we should be thinking about because it isn't just one size fits all. So, I'd like to just, if we can just push that one. And then let's shift over to just taking a look and going back through, so we're familiar with AppStream and workspaces. And then we'll go back over and kind of will be addressing some of the things that you raised, right. Candace, some questions that you asked on the student and then hitting the other things like that you brought up, Gary and and and then go from there. How does that sound, is that good?

Gary Moser: Peachy.

Heather Stratton (AWS): Awesome. Okay. Then let's turn it over to Ben and he's gonna talk us through.

Ben Trunnell (AWS): Cool. Alright, thanks guys. So first off, we'll take a look at the end user computing on AWS in general today will be really focused on workspaces and AppStream. But just know that there's also some other services that are in this suite of tools. So we've got Amazon work docs for online document sharing and collaboration. And then Amazon working for mobile secure web access so you can provide access to your secure applications that you normally might have behind the VPN that are on your intranet that you can provide over mobile phone type situation and all of these services are going to be fully managed pay as you go and have reliability and security built in and we'll kind of dive into that now. And you guys can please feel free to interrupt with your questions and we can kind of address those as we go along. Any questions so far?

Ben Trunnell (AWS): Alrighty. So always end user computing services are fully managed. So, you know, compared to running VDI on premises where you'd have to purchase hardware, wait for it to be delivered, rack, stack, install your hypervisor and all your other software for the VDI solution. If you use, you know, Appstream or workspaces you don't have to wait for any of those steps. You can just immediately launch your workspaces or application streaming instances. And, you know, underlying hardware is managed for you, the hypervisor layer is managed for you as well as you know some of the virtualized Desktop Infrastructure as well. So really, all you have to manage is what is unique to your situation. So, you know, you're going to be creating images that have the applications that you need to run and making those available to your users, specifying who will have access to which types of resources. So it really limits the scope of, you know, what you need to manage on a day to day basis and it makes it quick to deploy. We've seen other community colleges within 48 hours or six days, you know, kind of in that timeframe going from, you know, making the decision to do it to having a production implementation. So all these services are pay as you go. There's no complex licensing, all the applicable licensing costs can be rolled into your hourly or monthly costs. The edu customers in particular are often really interested in, bring your own licensing models because they've gotten great discounts from Microsoft on those licensing terms. There are some cases where we can bring in, bring your own license, but due to how Microsoft has kind of changed the restrictions that they're placing on their licenses, that doesn't often actually pan out for customers. The good news is that the EDU discounts that we can offer on the licensing really brings it down to where it's really in the same neighborhood as the bring your own license model so we can kind of pass on those edu licensing

discounts through the license included model and deliver a good price that way and then no long term contracts so, you know, turn it on, turn it off when you don't need it. That's the beauty of operating the cloud. And we'll get a little bit more into how the pricing works for the different services on the later slides. But any questions so far?

Ben Trunnell (AWS): Alrighty, and then we'll just touch quickly on reliability and security so end user computing services are built on AWS's amazing global infrastructure. These services are available in 14 regions right now. Each of these regions offer a great fault tolerance, disaster resistance with our Availability Zones, which you're probably familiar with. These sites are spread out, you know, across multiple floodplains and fault lines, etc. Even within a region to really give it that you know disaster level, fault Tolerance. And user computing services also support many security compliance standards, including a lot that we see in higher education like HIPAA, PCI and fed ramp. And then lastly, we support a 99% SLA commitment on the services to help ensure that your users are seeing good uptime.

Ben Trunnell (AWS): This next slide is a bit of an eye chart, but it just gives you a feel for how many large enterprise customers are utilizing our end user computing services, and we'll talk about some specific examples from the California Community Colleges later on. But here you can see there's some huge names like Autodesk, Samsung, Siemens.
Some really big names that have really been able to take advantage of EUC on AWS.
So diving into some higher ed use cases that we've seen in the California community colleges, it kind of boils down to two main use cases. One is virtual labs for students, so you can quickly and easily deploy your lab environments for students so they can use their real world applications from anywhere.
You know, like AutoCAD or solid works, even really intense applications like those are resource intensive applications.
So students can bring their own device. So this is also a great equalizer. So, you know, you can provide the same access to students, whether they're using a $3,000 MacBook, or a tablet, or a Chromebook, or PC.
And then students can bring their own files and they can upload those via the web browser. And they can also print to their local printers, and these are things that you can you know, kind of turn on and off at your discretion. If you want to kind of lock that down for security.
As far as the virtual desktops for staff and faculty-

Tim Calhoon: [noise]

Ben Trunnell (AWS): Does somebody have a question?

Tim Calhoon: Yeah, I was just gonna ask, in the Virtual Lab environments, will it operate even if they only have a phone, basically if they're down at that level?

Ben Trunnell (AWS): So usually the clients are kind of on tablet or above. Maybe, Andrew, If you want to chime in. I know that with AppStream you can use it from any client that has a web browser. But I think that usually excludes phones. So it might just be tablets and laptops.

Andrew DeFoe (AWS): So, it's possible. We've seen customers do it.

We do support for example, on AppStream, you know, with a browser based approach where we can support, even on a mobile phone, we can support pinch and zoom and gesture and and kind of different interactions with it. The challenge is always, of course, you know, one is the screen size and how does that lend itself to you know, working with the Windows application.
Which is primarily what AppStream is delivering. It's a Windows based application stream to the device. And the second is, you know, without a cursor and a mouse, navigating applications in Windows can be pretty tricky, especially if we're talking about applications in the learning space, like 3D engineering CAD.
So while it probably can be supported, the user experience may be a bit challenging.
So we tend to recommend at least a low cost Chromebook device, or a tablet, something with enough real estate on the screen to make it productive, and ideally, you know, a pointing device and a keyboard for kind of a PC-like experience.

Gary Moser: I appreciate the info, and that talks about the end user device, but what about the fight[?] to the person's house or location.
So what kind of a footprint does that require in terms of bandwidth?

Andrew DeFoe (AWS): So that will also vary depending on what you're actually delivering. We do utilize protocols inside of both AppStream and with workspaces that will adjust to varying network conditions.
The key things to look at will be maximum bandwidth and then latency. Latency is likely not going to be a problem for your students, located where you are into, for example our, our Oregon region.
We see customers that can connect from, you know, anything from Wi Fi to even LTE, and certainly broadband. Bandwidth will be potentially the challenge, especially for those 3D applications.
The bandwidth, you can be anywhere from one and a half megabits per second, up to 10 megabits per second. So by today's kind of home internet standards, they're small, but given that you're talking about those edge conditions of the students that are in remote areas, there may be some challenges with connectivity.
We think the protocol is designed to handle those, but there are definitely going to be scenarios where it can be, you know, fairly degraded if we're talking about extreme network loss and very high latency.

Gary Moser: Yeah, and typically on my files, what might be an option to consider as well too, at that kind of a speed level. And I'm not talking about 5G downtown LA, but yeah. Okay thanks

Amir Khan: This is Amir, kind of quick question about streaming gateway. How does that assist us? You know, how effective is this in terms of streaming the traffic and those types of things.

Ben Trunnell (AWS): Andrew, did you want to take that one?

Andrew DeFoe (AWS): Sorry. The question was on streaming gateway. Can you repeat that, I apologize.

Amir Khan: So I was just looking at, you know, it's just because the streaming gateway basically handles all the workspaces.[long pause]
Workspaces. Is that correct, the streaming related to those- [is cut off]

Andrew DeFoe (AWS): Yeah, so with both AppStreaming and with workspaces, all of the gateways that are required to deliver those resources to the end user's device are managed by AWS, so you don't have to worry about scaling those gateways or worry about, you know, management of those gateways. It's all part of the cost of the service and it's fully managed by AWS.

Ben Trunnell (AWS): Great, so, I think that about covers the virtual labs for students use case. The virtual desktop for staff and faculty, these can be either persistent or non persistent, so you can kind of decide whether you want your users to be able to install their own applications and maintain a custom workstation where they've got, you know, special applications installed and special things configured so you can kind of make that determination, and we'll talk about kind of the use cases in depth for this when we discuss the actual services that we're going to be using for them.
But for some of these, if you want to grant them the ability to have a persistent desktop, you can also even grant them the power to change how much computing or disk space is assigned to their instance.
That's pretty cool. And again, both of these are pretty easy to deploy and manage and we'll cover the steps for that as well.

Ben Trunnell (AWS): So next up, we'll talk about AppStream 2.0, this is really what we're seeing the most traction with customers deploying. It's very cost effective.
So the theme of AppStream is that your users, when they connect, they're connecting to a pool of shared instances. So similar to, you know, like a computer lab experience when a customer or user walks in. They're going to get the same exact experience every time they log in.
When they log out that instance is actually destroyed and a new one is deployed in its place. So they're always going to have that fresh, fresh user experience.
And then, let's see, you can also enable the user profiles to be stored. So that will save some of their application settings. So if you know they're like using AutoCAD or Photoshop or something like that, and they have application specific settings that they want to maintain, then they can store them. They can be sorted in the profile automatically and then restored onto their next session.

Ben Trunnell (AWS): For AppStream 2.0, users will connect either through an HTML5 enabled web browser. So that can be like on a computer or tablet or, you know, also possibly on a phone or there's also a client application that's available for Windows, so they can use that as well.
AppStream offers both application streaming. So, you know, just specific applications that users can launch from the launcher, or you can provide a full desktop experience, which is a new feature that's just for our educational customers.
And so with the desktop streaming feature, you also get like, the start menu and desktop application or desktop icons. So that kind of provides a more, you know, full workstation experience.

Ben Trunnell (AWS): There's a huge variety of instance types that are available as well. So with AppStream, you know, if you have, you know, just simple like, office type applications where they're going to be doing like, you know, word processing and spreadsheets, you can deploy a really small instance, all the way down I think to like, one vCPU and two gigs of RAM.
Which, I think the smallest one is two vCPUs and four gigs of RAM, but then you know, you can really scale that up all the way to like, over a dozen vCPUs, and over 100 gigs of RAM and GPUs, if necessary. So there's really a really broad array of instance types there, so you can choose what fits your budget and what fits your application needs.

Ben Trunnell (AWS): And then on the pricing front, you can deliver these applications or desktops to students for, you know, one low price and then just pay for the hours that you need. So that's often what we see the educational institutions doing, you can choose either to have the streaming instances always on so that they're available to connect to you immediately, or you can have them powered on, you know, right when the user connects. And then, you know, really only be paying for the time that users are connected.

Gary Moser: Hey Ben,

Gary Moser: What's the lag on that, between those two scenarios. What's the lag time for student if they're sick of Brighton and we're not, we don't have it always on.

Ben Trunnell (AWS): I think it's about like 90 seconds to two minutes to power up that instance, yes.

Gary Moser: Got it. Because I'm sure there's a significant cost savings if you do the what, you know, than if you do it by always on.

Ben Trunnell (AWS): Yep, yep. So, um, yeah, so there's the always on option. And then there's the on-demand option. And so with the on-demand option, you actually sit with a pool of shut down instances. And so really you're just paying for the storage for those instances that are shut down in your pool.
And I think that's like two and a half cents per hour for those shutdown instances. And then once users connect to those instances, then the price varies depending on what kind of instance that you selected, but, yeah, I think all start around 10 cents an hour.

Gary Moser: Yeah. So in looking at that, then what I'm, what I'm thinking is, if it's always, if it's on-demand, do you pre-pay for that estimated demand and you can get a discount, right, like a reserve distance? Or is it based on just the actual usage and time you pay whatever happens to be since its a live event.

Ben Trunnell (AWS): Everything is based off of your, you know, what is actually provisioned into your account. Yeah. And so with the on-demand provisioning method, you'll be paying for, you know, those shutdown instances that you have available. And it's really up to you how many of those you choose to have.
It does take a few minutes to deploy new instances. So if you're planning to have, you know, like a classroom is going to be starting at like 9am or you'll probably want. You can schedule out a

scale up to occur at, you know, maybe like 8:45am so that by the time 9am rolls around, then the-

Gary Moser: You pre-stage it. In other words, you have a, have it offline the rest of time so you get more of an instant response, but you can schedule that accordingly.

Ben Trunnell (AWS): Mm hmm. Yeah. And then you can also have it automatically scale as well. So if you have just kind of a generalized pool of instances the, you know, students are going to connect to, like, at their leisure throughout the day, then you can have it automatically scale up.

Gary Moser: I get it. It's like our current environment now. I mean, obviously, depending on what it costs out and availability. We got to evaluate both of those scenarios to find out what's going to be most effective based on what we want to pay. So, anyway, thanks, Ben.

Ben Trunnell (AWS): Yep. And we have a pricing spreadsheet as well that will really help with that. You can input what your expected use pattern will be and it will put a side by side price comparison for the on-demand versus always on.

Gary Moser: Great, thank you.

Heather Stratton (AWS): And just one second, Tim, I just wanted to check in with you because I know you said we have 30 minutes so we're coming to that. And I didn't know if people had more time for us to continue.

Tim Calhoon: Yeah, go ahead and continue.

Ben Trunnell (AWS): Great, thank you

Andrew DeFoe (AWS): All right. Yeah. One thing I want to add around the on-demand capacity is, obviously, in this kind of time of uncertainty, one of the challenges we're hearing from a lot of our customers that are rapidly deploying these virtual computer labs, is, you know, what is the demand going to be.
It's obviously hard to predict when you don't- you're establishing a solution in a usage pattern that doesn't exist or hasn't existed.
And so unless you have, you know, an existing environment like this, it may be hard to understand. And one of the things that on-demand does, it gives you the ability to scale out a fairly large amount of capacity.
But until that user actually signs in and search their active session, you're not paying the full kind of rack rate for that instance type. And of course at our lower end, which is just 10 cents an hour, it's not as significant, but if you're getting into, you know, our higher end graphics resources, not having to pay for a resource when a student isn't actually using it is great.

Andrew DeFoe (AWS): And so it gives you the ability to kind of blend availability and low cost with, you know, with the ability to just reach those customers in a situation where demand is just unknown. and obviously over time. What you can do is kind of get a sense of that utilization

adjust your scaling policies and maybe move more into that always on mode where you have more information and more confidence.
But we're seeing right now just, you know, our customers are just starting out, they're going from zero to thousands of instances in you know, 48 hours. And they're adjusting over time, but they're able to provide that initial capacity to meet the needs of their students working from home.

Ben Trunnell (AWS): Yeah. Thanks, Andrew, and this flexibility and having a low price point, I think is really the driver behind AppStream being the primary solution that the community colleges are going for.
We'll talk about specific reasons why you might want to use workspaces as well, once we touch on Workspaces, but the AppStream has really been kind of the meat and potatoes.

Ben Trunnell (AWS): Alright so next we'll talk just briefly about the provisioning steps for AppStream. It's four simple steps. First you'll use the image builder to install and test your applications, you know, kind of building that golden image for your streaming instances to use and be launched from this. The image builder just launches a single instance, you know, based off of a clean image or an image that you've been previously working on, so you can update it with your applications. Next you'll finalize that master image with your desired applications. Then you'll create your stack, which pairs your master image with CPU and memory and any optional GPU configuration you desire for your streaming instances to have.
Another great flexibility spot here is that, you know, because you're operating in the cloud, you don't have to make a hard determination up front what this is going to be set at. You can kind of set it at a baseline point that you think is going to be great. Get your users in there, see what the performance is like, and then you can adjust that up or down, you know, depending on what the user experience is like. So it's nice to have that flexibility.
And then lastly, you'll start those streaming desktop instances. Here's where you can specify, you know, the minimum and maximum sizes of your pool as well as configure auto scaling options and scheduled scaling preferences, you know, to help accommodate for, you know, either staff coming in at the beginning of the day or labs starting that kind of thing.
Any questions around the AppStream provisioning process?

Gary Moser: From your point of view, there's no difference whether they stream it onto a campus site or a home site. Right?

Ben Trunnell (AWS): Nope, all of it goes over the public internet. I believe that you can actually, you can make streaming endpoints in your VPC, so that they'll be routed through your private network, but most educational users, they want it to be over the internet because people are coming at it from at home.

Ben Trunnell (AWS): Cool. So next we'll just quickly go over Workspaces. So Workspaces delivers secure and persistent cloud desktops. So these are good for the faculty or staff use cases where they really need to have a persistent desktop where they can install their own applications. Perhaps, or, you know, configure their development environment, just the way that they need it. So this gives them, you know, that kind of one to one assignment between a user and their

desktop. So that's where the price kind of increases, because they're having those resources be assigned to them, you know, 24/7.
So you can operate the workspaces, either in an always on mode or an on-demand mode where it will boot up, you know, when they try to connect to it.
But even if you're in the on-demand mode where it boots up and they connect the underlying storage that's associated with their workspace is always there, kind of consuming resources. So that's kind of why the workspaces is a little bit more expensive, but it is still a great value for providing persistent desktops.

Tim Calhoon: And what are average times to boot up a workstation?

Ben Trunnell (AWS): I think it's similar to AppStream. It's about a couple of minutes. Maybe Andrew can keep me honest there.

Andrew DeFoe (AWS): That's correct. And it can be maybe a little bit longer, we typically see anywhere from two and a half to three minutes. In some cases it's relatively brief, especially from kind of a work from home on-demand scenario.
The reason why that the workspace may take a little bit longer to boot up is because we are saving application state. It's very much like a hibernation feature.
So we're bringing back application state everything that was left from the, from the user when they disconnected their last session. And so a little bit of a different recovery process than AppStream, but relatively brief in the scheme of things.
What we typically see is for those kind of remote users scenarios, if the user is just utilizing this as an occasional desktop to access. Let's say you know regulated data or applications that are protected and not public facing. The use cases, typically 80 hours a month or less, the hourly and kind of on-demand model is more cost effective. But if, if the user really is kind of taking advantage of that workspace as their full time desktop for their role in the organization: the always on. It's just a flat rate and they can use it 24/7 as much as they need to. So, you know, sometimes the cost will determine the best option.

Tim Calhoon: So, two questions. One is, can you schedule the workspace to be always on from like, 8am to 5pm, and then after that it would just be on-demand. Is that possible?

Andrew DeFoe (AWS): So you can orchestrate the warming up and kind of the starting of those workspaces. Let's say at the beginning of a work day what will happen there is, if you start those up and let's say nobody logs in, those machines will ultimately default back to a stop state because no one logged in, and there's kind of an idle time out, which is configurable. In fact, you could set it to eight hours and keep it running all day.
May not be cost effective, though, if people don't log in, but there is a way to kind of orchestrate a warm up period so that when you get that sign on storm in the morning, everyone's logging in, you don't have all of your users waiting for that two and a half, you know, three minutes. It's just there.
And so that can definitely be something that will improve the user experience, and we work with universities. They use Workspaces to do just that, where you can kind of just know that, hey, at 8 am everyone's going to login. Let's just have everything ready for them and you can orchestrate that to our cloud watch events service.

Tim Calhoon: And then any significant issues connecting the, you know, to a VPN to to campus networks.

Andrew DeFoe (AWS): Yeah, I can take that one Ben, from a VPN perspective, you can establish, you know, peer to peer VPN connectivity back to campus. So within the session. And this is true for AppStream and for Workspaces; you have the ability to reach back to connect to those private resources where that's file servers. Active Directory DNS. Security solutions that you have just about anything that you need on premises, you can establish peer to peer VPN connectivity. All that communication then becomes private and you can think of that, those resources in your virtual private cloud is just extensions of your, your current network.

Ben Trunnell (AWS): Yeah, and that's a, the use case that we've been seeing like with Ventura, especially, you know, they set up appstreaming, AppStream fleet, so that they could connect, they could have their users connect and get to their secure intranet, you know, websites that were part of their portal that were not available over the open internet and, you know, reach those applications.
So for the users that are on the hourly option there's a small monthly fee which covers the storage associated with instance while it's off and then there's a small hourly costs while the instance is online and then obviously with the always on instance it's just always on. And there's just a single cost per month for that.

Ben Trunnell (AWS): And again, a ton of Instance types available here. You know, very small, all the way up to huge instances with GPUs attached to them so you can choose what's best. And then as far as provisioning it's similar to AppStream.
Workspaces has a dependency on having an active directory. So, most likely, you'll want to, you know, establish a VPN to your on premises Active Directory if you don't have one in AWS already. And then you can create an Active Directory connector for AWS that helps facilitate AWS and workspaces, being able to create workspaces instance computer objects in your active directory and then also authenticate your users using Active Directory.

Ben Trunnell (AWS): Next, you'll create a master image for your desktops, which will include your desired applications and then you'll create a bundle to pair the master image with a compute instance type and storage.
So this is where you'll specify, you know how much horsepower into space that your workspaces will start out with, that's always adjustable later. And then you're ready to launch your workspaces for your users. So this is where you're actually creating you know this one to one instances that are assigned to every user, and then users will be ready to connect their cloud desktops, they'll receive a welcome email from AWS, that will give them a link to log into their workspace.
And then you know all of this can happen over the span of minutes or hours as opposed to weeks or months with traditional VDI so Pretty cool stuff.

Tim Calhoon: So, so Active Directory. That's it. No, no LDAP. No, no- [Pause]
No other methodology.

Ben Trunnell (AWS): Yeah, that's my understanding, Andrew, you could maybe Have an answer for that.

Andrew DeFoe (AWS): AD, yes we do support, In addition to that, if you're utilizing Azure AD, you can use Azure AD directory services to interact with workspaces. But in terms of other lightweight approaches like LDAP or ADL DS, those, those are, those will not work. We do need a full AD environment.

Tim Calhoon: Okay. Is that, is that because the operating systems that the workspaces are on is just Windows or is that the same for the Linux version of the Workspaces or...

Andrew DeFoe (AWS): Even with the Linux, we will utilize, you know, Samba will actually do domain joins. So the interaction with Linux and Windows desktops on your network and with your domain are relatively similar.
And yeah, it's just because we do the domain joins we interact and more or less, you know, establish those machine objects in AD and things like that. So it's a full-fledged AD integration. Now, if you have a scenario where you don't necessarily need your existing AD, you know, of course, we do have fully managed ad environments you can just spin up that are managed by AWS, just to be able to store your users. So you can create net new user IDs and just do something that's self-contained inside of AWS. If you don't need to leverage your existing identities.
But to the extent that you need to or want to we have those connector services that will just reach out and connect into your AD

Andrew DeFoe (AWS): Environment will just hit your DNS servers, find the locus. The closest domain controller and then use that to bind the machines and authenticate the users.

Tim Calhoon: Okay, thank you.

Ben Trunnell (AWS): That's a good call. I think I forgot to mention. So with Workspaces, you can do Windows 10 or Amazon Linux 2 as the, you know, the workspace instance operating system. So that's what they're going to be connecting to, will be Windows 10 or Amazon Linux 2, and then AppStream 2.0 at this point is only Windows. So those are gonna be like Windows Server 2016 or 2019 servers that are going to be doing the streaming there.

Tim Calhoon: Is Amazon Linux 2, is that Ubuntu?

Ben Trunnell (AWS): It split off of another distribution. But I can't remember off the top of my head what it is.

Andrew DeFoe (AWS): It's closer to CentOS and Red Hat than it is to Ubuntu.

Tim Calhoon: Okay, thanks.

Ben Trunnell (AWS): Awesome. Thanks, Andrew. All right. And then, Heather. Did you want to talk about some next steps are, or the other CCC we've been working with?

[pause]
Ben Trunnell (AWS): If you're talking, you're on mute, Heather

Heather Stratton (AWS): I said some really great things.

Daniel Watkins: your space bar works really well to mute and unmute quickly.

Heather Stratton (AWS): Well, that's good. At least I got that going for me. So I'll go ahead and kind of walk through these, and of course we have Glen, and we have Dan here.
But I just wanted to lay out for you if you didn't already know where we have, you know, helped Ventura College of Sequoias and now Mount San Jacinto deploy. And then also in the process, Candace mentioned that she was talking with us. And we've been working on getting AppStream up for her students, and so you know that's ongoing with her and then also State Center CCD who we've talked about both with AppStream and with Workspaces.
And so those conversations are continuing, and then also Gary, too, with Kern, we have a meeting set with you guys tomorrow, so.
Um, you know, there's a lot that's been happening out there and I think now may be a good time to maybe go back to what we were saying up front, and the question that you asked about, Dan, and that was: Okay. So we've done things at community college districts. We're doing those things at different campuses and for different- whether it's students or staff, but when we think about sort of scaling that across, how would something like that work if this committee says to the chancellor's office, "Okay, we recommend this or this is-"
However you want to take that on, how would it actually sort of work. And so that's why I wanted Andrew actually to talk a little bit about that and how that might look if you were to do something like that.
So Andrew, you want to answer that. Just take that spot over.

Andrew DeFoe (AWS): Sure, yeah. When it comes to, you know, moving fast and looking at, you know, the common needs, I guess, across all of the colleges, my assumption is that when you're looking at the application titles in the lab resources that as of today are obviously inaccessible, there's likely to be a lot of overlap and commonality. And so I think what, you know, potential approaches there, particularly around a service like AppStream is to think about how to organize your IT resources around building out a deployment architecture that allows you to, you know, reduce the cycles, I guess, in terms of providing access.
And one of the things you can do with AppStream is you can go through an image build process, establish kind of that common set of applications that are going to be required for all students, and work to immediately address that. And I think what we would typically see in, business as usual, it's going to be a specific college department or even course requires, a resource requires an application, and we engage at that level, or we engage campus wide, but in a scenario like this you know everyone's trying to rapidly deploy a solution.

Andrew DeFoe (AWS): This is a scenario that's sort of unprecedented so everyone's has the same issue essentially, so there's opportunities to work together, you can establish that image build process inside of AppStream, you can kind of build those libraries of applications.

AppStream allows you to, for example, share those artifacts and those images across multiple AWS accounts and so even if there is going to be a different way, those images and those resources get allocated to students, there is absolutely a way to centralize the creation and the process where those resources are built.
And that can be decoupled, and we've got some resources like this already. We've got, we call them workshop series, but they're basically code projects where you can launch into an account and essentially streamlines the process to get applications into AppStream.

Andrew DeFoe (AWS): But what I would encourage you to do is think about kind of, you know, the tiger team. If you want, it's a term we use for all these different things, but it's kind of a team of resources across your colleges that might be able to participate in something like that. More than likely it's going to be the same title as probably, you know, Adobe Creative Cloud. Maybe AutoCAD, solid works. We've done a lot of work with Esri, I know many of you guys are using Esri and ArcGIS Pro as some of your programs.

So these are application titles that we've seen, we've worked with, we have good relationships with those vendors and I think we can work with you to kind of establish that.
And then you can decide, you know, what's, how do you want to distribute that to your students. Is it one application at a time. Is it all at once. You have the full freedom to iterate.
And we typically encourage iteration on something like this because you don't know what you don't know. You're kind of diving into a new technology. Most of our customers would do this in a 100 day cycle, right, they'll take it through a course or an academic term and now you're being asked to do it yesterday. So you have to move fast. But you're able to iterate with our services, there's never a commitment. So you can just kind of get started, start releasing solutions, learn from the students, understand the feedback, adjust your scaling, your instance types; but I think having kind of a clearing house where you have some IT resources that are building out those images, getting the applications prepped, can really help you save time across your campuses.

Heather Stratton (AWS): Thank you, Andrew.
Um, and then we also included in here-
Well, actually, let me back up on that. So if you did think about sort of scaling out something like that because I, I believe that has been discussed, or that's what you guys, that's what has bubbled up.
And so thinking about that, how would you, where, would that start with that live at the tech center, Tim? Or is this all just, I don't know, "we have to talk about it. We're not sure we're figuring it out."

[Tim is muted]

Tim Calhoon: Talking about not knowing what you're doing.

[Laughter]

Tim Calhoon: Yeah, I would say, we're in the, how might something like this be, I mean, we're just not, you know, like, we don't have instructions on "go and do this," you know, we're really kind of exploring at the moment. Okay.

Heather Stratton (AWS): That's fine. Yeah. Thank you.
And Dan did that help answer your question. I mean,

Daniel Watkins: A little bit. I mean, I think we have an opportunity to think differently across our organization which is kind of One of the reasons why I wanted AWS to talk to the SAC group, because I think about how vendors will sell their application individually to every college, right?
If we're able to centralize some of that stuff, centralized some of those applications. I mean, I just think about the library systems project, right, if we stood up an AWS instance where all of our students can access those library resources and do it once, then you don't have that- the way we rolled that out would be significantly different.

Heather Stratton (AWS): Right, yeah.

Tim Calhoon: I mean, I, I'm wondering if, you know, like, there might be an opportunity to find common applications that all the colleges are using like AutoCAD or something like that, right, that could be AppStreamed and set that up in, you know, in sort of a global system wide instance and, you know, students could log into that via- they couldn't log into that via their local. I don't know if we can make, you know- we've been using Shibboleth for authentication, couldn't[??] make that work. You know, could they log in using their system wide student account, into something like that or would more of a distributed model makes sense where each college, you know, had their own, you know, could we could. We can, we basically create instances of AutoCAD that could be distributed to the colleges, you know, sub domain, basically.

Andrew DeFoe (AWS): Yeah, I think we would encourage, you know, just for the sake of expediency, as much consolidation as possible.
Given that the more users you have coming into, let's say, a pool of upstream resources, the more cost effective that will be unless you sat through the course of that process. You see there's a lot of diverging needs where, you know, you may have a particular use case that's a little bit different. But I think consolidation certainly is more efficient.
Your question about Shibboleth. That is something we absolutely can support with AppStream. We do integrate with any SAML 2.O ID provider and we have, you know, many of our schools that use Shibboleth as the ID provider. So you definitely have a way to link that up where you're using common identities to access those resources.

Tim Calhoon: That's abstracting the- In this case, then, unlike Workspaces, that's abstracting your Active Directory then, so Shibboleth will work for-

Andrew DeFoe (AWS): In an AppStream case, absolutely. In AppStream case AD joining it's totally optional. And so in scenarios where you're talking about AutoCAD and Adobe Creative Cloud and most of these applications. There's not a lot of AD dependencies there, so we can just take AD out of the equation and just focus on the LDAP and kind of that SAML based approach, which is typically a lot more flexible and extensible.

Tim Calhoon: Okay.

Amir Khan: Are we also able to enforce MFA.

Andrew DeFoe (AWS): We can enforce MFA with both of our services, with, from a Shibboleth perspective. That will be handled through Shibboleth.
From a Workspaces perspective, we utilize radius infrastructure with AD.

Amir Khan: Alright, so I have a couple of security questions. Maybe you guys can email me the answers for them later on.
So what I'm interested in finding out is how do the administrator for this would provide, or any administrator, would provide a secure and auditable method to access the back end environment. And how do you reduce the attack surface by hiding the shelf of streaming, something like that. So I would like to know how that is done in AppStream 2.0.

Heather Stratton (AWS): You want us to just take that offline and then follow up?

Tim Calhoon and Amir: [unintelligible]

Heather Stratton (AWS): Okay. That's great.

Tim Calhoon: yeah, I'll get you Heather- If you don't have Heather's email, I'll get your Heather's email.

Amir Khan: Yeah, there's some technical questions that I don't want to bore people with.

Heather Stratton (AWS): Listen, we talked a lot of tech around here. So, I don't answer though, but we talk a lot about it.
Okay, so, um, the only other thing I guess we were going to show, just so it's clear and maybe, Ben, you can hop down to the AppStream and is Candace still on?

Candace Jones: Yes, yes.

Heather Stratton (AWS): Yeah, hi. Okay. Will you go down to the AppStream one and I know I just want to make sure, Ben sent this to you earlier, but you had a question about the apps. And since we're talking about it, right.
So this is what the sort-of launch site- /The/ launch site would look like- I actually put some examples from Ventura and the College of Sequoias on here too, but I just wanted it to be clear that it can be multiple, that was one of the questions that you had, so this is what it looks like. And maybe, Ben, If you just want to pop over to, back to Ventura's and then-

Ben Trunnell (AWS): Here's San Jacinto.

Heather Stratton (AWS): Mt. San Jacinto, College of Sequoias...

Ben Trunnell (AWS): I don't think, we don't have one for Ventura

Gary Moser: Dan just doesn't want to play, my goodness!

Heather Stratton (AWS): Yeah, no, it's on my version.

Daniel Watkins: I can share a live instance of it if you want.

Heather Stratton (AWS): Yeah! Why don't you? Yeah, yeah, yeah.

Candace Jones: Heather. We were just trying to map different stacks that we had,

Heather Stratton (AWS): Yeah,

Candace Jones: Onto one page, rather than having different links to each of the individual, like QuickBooks. Right, we had, we have that installed on a separate stack, but we have all the Microsoft on another stack. And so we're just trying to combine all the stacks to one unbranded page, which we talked to Marshall and those guys about that today.

Heather Stratton (AWS): Perfect. Okay, so got them.

Tim Calhoon: Do you have a published list of applications that, common applications that you know that work with AppStream

Heather Stratton (AWS): Yeah.

Andrew DeFoe (AWS): So we, so the, the full list of applications that we know work with AppStream is somewhat tribal, if you will, in terms of how we can, you know, store that information. I think if you engage any of our solution architects or specialists, they'll be able to look at your application list and kind of give you a "yep yep yep yep yep" and there's sometimes some nuances with certain applications. Particularly around licensing that we may need to get into.
For example, we may need to communicate with a license server that you may have in your data center in some cases. And so those are pretty well established patterns. I would say there, most of the applications, you'll likely list are probably the ones we've seen.
There may be some exceptions and we always like those, they are new for us.
We do have a list of applications that have been validated and essentially certified for use on AppStream where we've co-authored best practices and deployment guide so that way, we have a list of that on the website. We can share that with you.
Solid works, SAP, Client, Esri ArcGIS Pro, MATLAB, AutoCAD, are just a few of those titles.

Tim Calhoon: Yeah, if you could send me a list of the common apps that you're seeing colleges use that are verified.
That, while I could then share with the SAC Committee, and the Committee would say, "Yeah, we want MATLAB. We want AutoCAD. We want this. We want that," you know, if there's 10 or 15 different applications that are common among the colleges, you know, that might be an opportunity to go, you know, to the chancellor's office and say, hey, they could use all of these,

you know, everyone could use these we could get them into AppStreams and we could get, you know, have a centralized instance for students to get to them.

Heather Stratton (AWS): Okay. Yeah, we can do that.
Yeah, and you know what, in talking with Amy [Last Name Uncertain]. I know at the CSU system, they have their cloud acceleration center. And so they're building that out in their first sort of use cases AppStream for everyone. So they're working with ProServe and they're getting that dialed in.
And I know that they came up with a list, also. So I'll get our list, and I'll get that back to you, Tim, for sure.

Tim Calhoon: Okay.

Heather Stratton (AWS): So, next, next steps. What- I mean, we have follow up.
I think I answered everyone's question. I think we got to everything. Did I miss anyone? Did I overlook any questions that were asked,
um, maybe I did. I did. Gary, there was one that you asked. And I think it was around, like, you know help or costs, or those things and-

Gary Moser: We'll talk about it tomorrow, Heather. I'm not worried because I know we've got a time limit here, for our committee, that we can, We can touch base tomorrow.

Heather Stratton (AWS): Cool. All right. Anything else, any other questions?

Tim Calhoon: No, that's great. Thank you very much.

Heather Stratton (AWS): We appreciate it. We really appreciate everyone's time and the opportunity to talk with all of you.

Tim Calhoon: Alright, so. Thank you.
So SAC members, we didn't get around to the ERP Survey. Probably less important at the moment, but long term, you know, we want to get that out there.
I think what I'll do is I will send out a Google Docs version of that to you, and you can just go in there and make suggestions and make changes, whatever, and we can just collaborate on that. And I'll probably give you a deadline of, like, maybe a couple or three weeks from now, you know, and you can go in there and I'll send out reminders too, but to be able to go in and edit that and see if that makes sense. If what's already in there makes sense. And if you want to add things to it. So we can actually get, maybe, get this thing done before the next SAC meeting.
And then I think the idea of maybe trying to find some common applications makes sense, you know, that could be AppStreamed and students could get to them, if we wanted to make it simple students could be, could get to them through our SSO gateway. So all of your IDPs are connected to the SSO gateway and the SSO gateway's IDP passes on to a service provider like AppStream, and that might be a common way to just set this up very quickly and get it working if there's funding to do something like this.

Gary Moser: Ahaha, if there's funding, Tim. [Unintelligible]

Tim Calhoon: No, I mean, you're right. There certainly- Who knows! I don't know what's going on at the, at the funding office.

Daniel Watkins: I know that Amazon, and I'm sure they're going to extend this to any college that works with them, gives them two months pretty much worth of credits. So I think, you know, we can get something up and tested, and see if it works. And if it's worth funding, but, you know, not have to pay for it initially.

Gary Moser: Yeah, a pilot's a good idea, Dan.

Tim Calhoon: then there's also the licensing of the software. Right. the, you know, that we put out there, so.

Gary Moser: Absolutely. That's why it's a good idea, I think your list of common apps is a good idea, Tim, because if most people or all people are licensed like Microsoft, that might be a no brainer. At least start with, you know.

Unknown: Or even Adobe creative Suite

Tim Calhoon: Yeah, yeah. --- most likely --- theory that we could get common licensing, we've talked about that in the past and never let a crisis go to waste. Right. Yeah.
I gotta jump onto another call
Bruce will send out the meeting minutes or the recordings and etc and we'll also, you know, but uh, we're set up for next month. Again, same, same, you know, same time.

Bruce Racheter: Fourth Thursday

Tim Calhoon: Yea, Thursday. Thursday. Fourth Thursday or third or-

Bruce Racheter: Fourth.

Tim Calhoon: Okay. Great. Alright, fourth Thursday 1:30 alright. Thanks everybody.

Gary Moser: Have a good one, Tim. Take care.