United States Election Assistance Commission
Commercial-Off-The-Shelf (COTS) Products Roundtable

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VERBATIM TRANSCRIPT

The following is the verbatim transcript of the Commercial-Off-The-Shelf (COTS) Products Roundtable of the United States Election Assistance Commission ("EAC") held on Tuesday, February 15, 2011. The roundtable convened at 9:06 a.m., EDT and adjourned at 3:48 p.m., EDT.

<u>COMMERCIAL-OFF-THE-SHELF PRODUCTS ROUNDTABLE</u>

DR. KING:

Okay, well, good morning everybody. Welcome back. I trust everybody is rested and has had an opportunity to reflect on the discussions yesterday, and ready to move forward this morning with continued discussion on COTS and its implication in the EAC's Voting System Testing Program.

This morning we will have, I think, at least one participant joining us later by conference call, and we'll set that up after the break. We'll try to break right at 10:30 today, as we did yesterday, and lunch, also, at noon. So, if we can pace ourselves towards those goals, I think we'll be in good shape.

This morning -- we did give you a homework assignment and we're going to come to that in just a moment. And this morning, Brian is going to open our discussion with a review of the existing VVSG definition of COTS, and then, the proposed change in the next version of VVSG.

MR. HANCOCK:

We'll do that later, when we do the summary.

DR. KING:

Okay. And so, I like always the strategy of anchor and adapted, that is, bring it to what we currently have, and then see where we need to make changes moving forward.

So, with that I'd like to ask Brian to start off the session this morning. And we'll turn it over to him.

MR. HANCOCK:

Thank you, Merle. I thought to put our discussion in context of some of the things we've talked about yesterday and where we're going to move forward today, I thought I'd talk to you a little bit about where the EAC is right now, as far as the incorporation of COTS into our program. And I thought the best way to do that would be to use a concrete example of a system that we have certified.

And James, if we can bring that up. And McDermott, with your indulgence, I thought I'd use the Unisyn system as an example here. This -- the document up on the screen, right now, is our -- a Certificate of Conformance. We have one of those for each of our certified voting systems. This happens to be for the Unisyn system. As you see -- can we shore up that just a hair? That's great. This is just the page showing the general layout of the system but, obviously, there are COTS components, right, desktops, laptops, again more PCs down there, desktops. In fact, this system is very heavily, as McDermott said yesterday, COTS reliant.

If we move onto the next page, we actually have each system component listed, the versions of software, firmware and hardware. And if we move down, we talk about COTS systems right here. The system that was tested in our voting system test lab is for Unisyn used as a desktop component, a Dell OptiPlex 755 by Dell with these specific characteristics of that system. The laptop -- that's good right there. The laptops were Dell Latitude E5500s with

the specific characteristics right here. We also have the Dell printer, COTS printer listed.

Now, these were the systems that were tested at Wyle and are part of the EAC certified system. And that's fine. Here's where we run into problems, and where we have already in our program run into problems with the use of COTS. I'm not sure if this actually applies for this system, but I would suspect that if you went out there, right now, you could probably not buy a Dell OptiPlex 755 at a Best Buy or anything like that. In fact, we have had instances where a manufacturer has come in with a desktop or a laptop, be it Dell, HP, whatever, and before it's out of testing this system, this COTS component is no longer sold in the commercial marketplace. And so, where it puts our election jurisdictions is between a rock and a hard place, really, not to mention our manufacturers. Once a system is certified and out there, if these need to be replaced, it's going to be with something other than the Dell OptiPlex 755.

Now, from a practical standpoint, we are currently allowing machines that have the same characteristics, the exact same specifications to be used. That is where we are from a practical standpoint. I think what we need to discuss today is, is that where we should be? Can we do anything else, you know? And what are the consequences for our program, for the voting system manufacturers and frankly, most importantly, from our perspective for State and local election officials out there that are incorporating COTS into their EAC certified voting systems.

And, of course, when these things are tested, because the voting system test lab determines that they are unmodified COTS,

they're exempt for a large -- from a large part of the testing that's required by the Voluntary Voting System Guidelines. Now they, of course, are functionally tested with all the other components of the voting system to make sure everything operates and integrates correctly. But for a large measure, a lot of the hardware testing these things don't have to go through. For operating systems, obviously, as we talked about yesterday, we're not going to go have the voting system test labs try and look at Microsoft's operating system or anything like that. So, it does save time and money in testing to use these things, there's no doubt about it. But, again, because of the lifecycle issue that we talked about yesterday, we run into the real-life problems of components; desktops, laptops, printers, things like that, being out of date, potentially -- certainly when -- between when a system comes in for certification and when it finally gets out to the election jurisdictions, and potentially, even quicker while it's still in certification, depending on how long that process takes.

So it is a real conundrum, and it's something that we have to deal with on a day-to-day basis. So hopefully, the rest of our discussions today can explore these things. Hopefully, your homework assignments have created some new and different ways to deal with this problem. But this is where we are right now.

DR. KING:

Okay, thank you Brian. Any comments regarding this?

James is there in this document an articulation of the operating system? Are any of those identified?

MR. SMITH:

Just right above it. Scroll up about another four inches on the page. I thought I saw a more granular listing just above.

DR. KING:

Okay, thank you. Thank you, James, for scrolling that down.

So, I think Brian has done a good job of illustrating by example what the EAC sees as some of the issues associated with the definition and the operational issues related to COTS within the context of their program. And one of the things that I hope we can accomplish today is kind of teasing that apart at a more detailed level, and particularly exploring the interface between COTS and MOTS. What are the attributes of a COTS component when it transitions out of COTS into a modified component that then must be tested in the system? And I'm hoping that we can do some brainstorming on that and give the EAC some material for their consideration to look at on how they might fine tune that definition and then subsequent programmatic decisions on operationalizing that decision.

Last night we gave homework assignments to everybody, and I think that's where we begin today. And then, we'll move on to the remaining questions in our list. The first question was, give an alternate method that the EAC might use in certifying COTS products.

And what I'd like to do, Brian, if I can, before I ask for input from this group is, if you could kind of give us a recap of what you currently do just to make sure that we understand what we would be transitioning from.

MR. HANCOCK:

Right, well, right now, I mean I just talked about what we currently do, right? What we're looking for is a different paradigm, you know. I gave a few examples of things that we've talked about internally and that we've heard from, from other parties. You know we could potentially do things like certify a list of major COTS component providers. We could again say, for example in this instance, for the desktops, as long as the manufacturer stays within the same series of Dell desktops, that's fine you know. Only when the COTS manufacturers moves to the next series do we need to even consider, you know, whether the specifications in form, fit and function are the same.

So those are the types of sort of outside our current box type of things that we're looking at from you all.

DR. KING:

Okay good, thank you, Brian. All right, let's open that question up for discussion.

MR. COUTTS:

Well, one of the things that does keep popping up is, and we discussed this earlier, is COTS, is a point in time. You say, "This is COTS and at this point in time this is what I can buy," and that -- so it's not only the hardware but the firmware of the product. So I'm buying a Canon scanner off the shelf with version 2.22 software -- or firmware on the system. I have no control over that. If you go out and buy that three months later, it may be 2.225. Now the question is how do we -- do I need to certify that? Because, if I have to roll that firmware back to the previous version that makes it MOTS, doesn't it?

DR. KING:

Um-hum.

MR. COUTTS:

Because you can't buy what I certified. So, the question is, how do we -- we need to keep -- we need to have a way of keeping this constant without -- keeping this current without having a huge testing event as part of this. And this is one of the places I think we need to keep, you know, keep our finger on the pulse and say, "Hey, let's make this quick."

DR. KING:

Okay. Let me, if I can, ask a follow-up question, McDermott. On the issue of the example you gave of a scanner that has its firmware migrating within a different model, is -- a part of what we're struggling with is that COTS is such a heterogonous collection of components that finding guiding principles that govern PCs doesn't really apply well to scanners, isn't appropriate for thumb drives, is difficult to interpret for printers, et cetera. Is there any advantage in attacking our definition of COTS by creating categories within COTS in which it may be easier to formulate strategy and kind of scrape the anomalies, scrape the outliers into a pile to be dealt with in an ad hoc basis?

MR. COUTTS:

I think that you can definitely categorize them in that manner. A number of peripherals have standard ADIs. They have common interfaces that are well defined, often depending on the language that you're using. For point of sale devices, there's Java pause if you're using Java, like we do. And that you -- again, there's a little

bit of -- there's variation in there that you have to be careful of. I mean, you can't just throw this stuff out there and expect it to work, you have to test it. And we do. We need to make sure this stuff works before it goes out of our doors, much less before it even gets to the VSTL.

So being able to categorize things, like the USBs, which are almost a consumable in this case, to PCs, to peripherals. Peripherals have a much greater tolerance for backwards compatibility, PCs do not. So you can -- I think you can definitely categorize them in that manner.

DR. KING:

Okay. Pete?

MR. MARTI:

Food for thought. If you had three different categories and one would be the system itself and you would define what, you know, what the components are in it, then you would have a second one are peripherals which would -- and you would define category what's in that. Anything -- like you were -- exactly what you were saying with the devices; readers, scanners, whatever those devices are because they're terminated and talked to by certain interface and they can be handled -- whether they change the software or not, that's -- hey, that's controlled by the individual manufacturer. But the third one is the consumables, and that's your independent read devices. I mean, like the CD, any kind of -- any kind would be. Then, if you have three categories now you can attack it and say, "Okay, for us to really make it work we've got to have three -- a minimum of three qualified," okay, three different types of card

readers, three different types of printers. And you would start the list by probing the field and saying, "What is working out there, right now? And that's what we're going to populate it with." But then, you'd be looking at the whole thing and saying, "Okay, where are our shortcomings? Where do we have to get back-up?" The hardest one, of course, is the more complicated, which is the PC. But defining it, exactly what the functionality is of that base core and having the consumable one would handle a lot of it, would focus it down on consumables. Who makes good devices, you know, thumb drives, et cetera, et cetera. You come up with an approval list and as long as you could buy it from those three.

The key to -- the trick to, like with the PCs, when they go out of obsolescence you've got to be notified a lot sooner. In other words, shoring up the communications with the suppliers. If you say, "I'm using a Dell OptiPlex 755," as soon as Dell knows, you know, they should be notifying you saying, "This is when we're going to cut over to a new model" and be supplying you the specifications, what's the difference in it and immediately looking at that new model or another PC to add to your list of choices for the end users and whatever.

But that's what I think would work in this case for what you're dealing with. Sure, the timeframes are -- the more communications with who's supplying it. You can't sit back and wait for the point when they go out to buy a new computer to find out they don't have that model anymore. Well, you should have known about it a long time. And that's shoring up communications with Dell, because your list of what you're trying to do and what they've got to pick

from is really driving on it, because you've got to retest whatever that testing of the new, anything on either one of the categories of any one of the devices. You've got to find a replacement or you've got to find an alternative before they come back and say, "We got to go buy a different." That's way too late in the ballgame. So, I think the communications has got to be backed up.

So, it's not an easy situation, but depending on what you decide that you're buying and basically looking at this, I think it -- I just support what you were saying is that you really look at what are my consumables? What are the consumables? Defining it and saying what are in those. So, one, you shouldn't have to get into the rev of the firmware. You shouldn't even have to record it. It's a matter of fact they tested a new one with the new -- them saying they're going to change it, then you get a new one in and it gets reverified. It might not be a full-blown test, depending on what you determine to qualify anything. But shortening the approval time of that particular component, like a new printer, you should never even hear that from them. They should have three choices and they should be readily available. But you've got to be notified, so you can go out and actually qualify a new vendor and know that that Dell OptiPlex is going to be. And I'm sure Dell will divulge that and give you at least the global specs and keep you abreast when the first one that you can get. Before anybody even knows a new model is coming out, you get one so that you can retest. I don't think there's a problem there.

But that's, you know, you need that kind upfront, so you can do something and qualify a replacement before it's needed.

DR. KING:

Okay. I think McDermott has a question related to this.

MR. COUTTS:

Well, no, it's just a statement. I want to say I have been working with Dell Federal and they have been in a divulgatory mood, as it were, regarding when things are changing and how they are changing. So when I communicate with them, they do give me an update as to how things are moving.

The real issue is actually the difference between when I certify and when people actually buy because the number of revs that will go -- it's almost -- it's not almost, it is a full-time job for somebody, luckily, not me all the time, to track what is current at any given point, and then, you know, three months, six months, a year down the line when somebody says, "Okay, now I'm going to buy it," I am so many revs down the line. How many of those -- did I test every single one of those down the line? The cost then starts going through the roof. So -- but the further you get away from your baseline the harder it -- the more likely you are to run into a problem. So it's a rough road to hoe.

[Laughter]

DR. KING:

I'd like to come back and ask Pete a question, and then, I'll come to Paul and Ed.

In the model that you described, it appears that it addresses, if you will, a breadth issue. And summarizing, when a vendor submits a system for approval instead of specifying a single PC that can support the system you'd provide a breadth of options. I think

what McDermott has said several times, there's also a depth issue over time that becomes critical. And one thing I like about your suggestion is that by increasing the breadth of options you may also increase the options down the line, in that, because these are COTS components, Dell may be cycling through revisions to their product faster than an HP or faster than another integrator of a system. So I think what you've described, really, it has a good investment into the process. But I think the cure has to address McDermott's issue which is three years out, five years out, and now, when we get to the jurisdictions seven years out, eight years out, how do we address this depth of availability and not just that breadth of availability?. Do you have any experiences with other industries or other products that seek to address that?

MR. MARTI:

Well, I've seen this type of thing and I understand the depth. That's the other issue. Definitely, that's the biggest one. When do I buy? What do I buy? First off, you've got to keep in contact with what they'll divulge to you when they're coming out with things or whatever, whether they -- if they don't communicate, it makes it twice as bad.

But to address the depth issue, you have to do an engineering judgment at what model. Say they come out -- once Dell lets you know they've got a new model coming out, you look at that when it's coming out, how long it takes you to reverify one with what changes they say, how big of a test program that you've got to do and when he plans on buying it, when he expects to buy, not necessarily concrete, but when you think to buy so that when you

do actually buy you know that there's going to be product there for you to buy.

So the depth issue was a combination of knowing what's going to be available in six months, but you knowing when you've got to buy, or working with you knowing overall what's going on, who's going to be doing it. I think it's definitely a combination thing, because when do you buy that's the biggest thing. Or do I go out and say, "Okay, distributors, how many of these have you got out there," you know? But the first thing you've got to know is, when is it going to be obsolete, when are you no longer going to be -- oh and eventually in time there's not going to be support for that particular device, whether it's a printer or whatever, you aren't going to get support even in the software. Same thing they keep dropping off the backend. They introduce new, but they also drop off the support of that particular device, especially software. And that's got to really drive you through the hoops unless you're using the latest and greatest, which is what they normally support.

So, it's a moving target and the depth issue is definitely a big one.

MR. COUTTS:

Luckily, we get around software a little bit by using primarily open source libraries. So if the support is not there, we do it ourselves. Luckily, that actually hasn't come into play.

DR. KING:

Okay, good. Paul, and then Ed.

MR. STENBJORN:

I wanted to discuss a couple of things. I think it's certainly laudable to look at ways in which we can shorten the process to have COTS -- changes in COTS recertified more quickly.

A couple of things I want to remind everybody of and most everybody certainly knows this is that the certification process is not just a technical process. It's really -- it's a regulatory process. States and municipalities have to address the regulatory concerns at both the State legislature -- mostly the State legislature, but sometimes City Council, in our case. And the certification model, what it does is it provides us with a structured model to follow, so that not only do we maintain regulatory compliance, but that we also maintain public trust. I mean, that's the entire -- I mean, that's the underpinnings of why we have a certification model to begin with.

From a technical standpoint how that translates is that our shelf life for this equipment is substantially longer than the vendor's shelf life for the system. We purchase a system and we anticipate we're going to have an ownership of this system between eight and 12 years. So there's going to be an awful lot of evolution on any of the COTS products over that lifespan. And ensuring forward compatibility is something that is not envisioned by the -- at least, I don't see it as part of the certification model.

So -- but rather than simply saying that there is going to be this -- there's going to be an inventory of items that can be purchased within some sort of certification scheme, I would like to a process where we can have testing without recertification of COTS. I think that would probably be the -- where we -- there is some

structured, formalized test that doesn't require bringing the entire stack through recertification. That would allow us as local election officials to be able to buy from a wider array of potential vendors out in the field, especially when we're talking about printer peripherals and other things that may be consumables, like CF cards but may not be, things that would give us that broader latitude. I'm thinking specifically about the internal printers on the DREs, the VVPATs. Those are things that currently we rely on the vendor if we have a failure. And it would be nice if we could go out and research and purchase our own because we do have the staff that could do the repairs.

DR. KING:

Purchase -- I'm sorry, testing by whom, when you say testing without recertification?

MR. STENBJORN:

That's a good question. I mean, you know, to be honest, I think it would be -- I mean, to put something through a testing regimen maybe through the VSTLs. Maybe through the -- maybe a self-certification from the vendors with teeth that if, you know, something proves not to pass muster in the field. But working with our vendor -- our vendors, plural, I would feel comfortable if there were a level of self-certification if there were, you know, if the EAC had some sort of oversight and governance.

MR. HANCOCK:

So Paul, my question then, would be how would you get -- if you were purchasing those printers yourself, and I presume installing

them yourself, how would you get around the warranty issue that generally comes with that product when you buy it?

MR. STENBJORN:

You know, that's a good question. In our instance we -- the warranty issues would not be an obstacle, because with the iVotronic the printer is actually housed in the casing. That is not covered by the system's warranty. So we wouldn't actually be opening up the system and violating its warranty.

But, in other instances, I could certainly see it, like in our optical scan units, where replacing that printer would not be something we would be able to do it, because then it would violate the warranty.

DR. KING:

Okay, good. Ed, and then Luis.

MR. SMITH:

I'd like to address McDermott's comment earlier about firmware versions in COTS products as they evolve and what not, and even the hardware may change, too, but the firmware, in particular.

When you say -- or let me ask a question. So, I have scanner "A" that's at rev two, I certified it at rev one, but I've asked the manufacturer of that COTS device to give me the product with firmware revision one. Is that MOTS? I would say "no." To me the "M" in MOTS is modified by us, the registered manufacturers in the program. The fact that you can't buy it today unless you have a special relationship to me has no bearing, because you could buy it at the time that that was what that manufacturer was offering. So I don't consider that MOTS.

And, in fact, I'll even go one step further and say I consider it our responsibility, as the voting system manufacturers, to think through, okay, I have an external printer. It's an HP laser jet. I may not care what firmware and hardware changes HP makes to that. But, on the other hand, maybe I have a scanner that's internal to my device and I want to set up a business relationship with that scanning manufacturer that says, "It will always be the same. It will always be exactly what was tested, because that's a critical component and it can't be allowed to change without my knowledge." And so, I think that that's where we have to do engineering evaluation and document in our TDP what's going on. But to me MOTS is modified by the registered manufacturer. If you can buy it or you could buy it, to me it's not MOTS.

DR. KING:

Ed, when you say the "M" in MOTS means modified by the vendor, would that include at the direction of the vendor? In other words there may be...

MR. SMITH:

Sure.

DR. KING:

Okay. Okay, good.

MR. SMITH:

They may do it. They may add the guide on your scanner rather than at the site of deployment or at one of the manufacturers -- the registered manufacturer's facilities. But, yeah, if it's at your direction and if it's different, then, yes, then that is MOTS.

DR. KING:

Okay, good. Luis.

MR. TORRES:

You know, in this discussion, I took the homework assignment and I sat back and I started looking at some case studies that were out there on the Internet, and I started thinking about the way things are done in the State of Florida. We have our own certification process. When a vendor brings stuff to the EAC, our version levels way pass that version level that's sitting at the EAC. And things move a little bit quicker in the State of Florida, because of our own certification process and we don't go by EAC rules, which, that's a different story.

But -- and that being said, since there are testing criteria that the State of Florida already are using in certifying the equipment, if there was a way that the State of Florida could share that information to streamline the process in testing that new firmware version at the EAC level. So, it's almost like a shared information with States that do certify their equipment with the EAC.

And I want to -- Pete mentioned, I like his categorizing of systems, peripherals and consumables, but I want to throw in there, I think the software needs to be a category, too, because software -- systematic software or software that actually -- programming software, I think those have to be spelled out.

DR. KING:

Okay. Let me come back to a point that both Paul and Luis had made about leveraging certification testing other than that done by the VSTLs for the EAC. And Luis, I think I heard you say that Florida uses the VVSG as a part of its guidelines…

MR. TORRES:

Yes.

DR. KING:

...but may layer on additional test criteria that reflect statute in the State of Florida, and other jurisdictions will layer on IT best practices and other issues. Is there, currently, a clearinghouse, if you will, for jurisdictions to share -- and for purposes of our discussion talking about COTS components, not necessarily voting system, in toto, but would that be advantageous to your jurisdiction, yours, certainly to mine, that there be a method of rapidly sharing those certification tests and reports on COTS components?

MR. STENBJORN:

Well, specifically, from a certification standpoint, there is -- I'm not aware of any mechanism for sharing the certification. And when I was in Virginia, we had our own certification model. We offered it to others who requested it. But, really, where the information exchange occurred was mostly through user groups, through the vendor user groups. And I mean, we're ES&S jurisdictions and we can share information about our specific experience with our specific equipment across jurisdictional boundaries, but that doesn't speak specifically to certification.

DR. KING:

Um-hum.

MR. TORRES:

And, I mean, recently in 2010, after our general election of 2010, my boss decided, let's bring all the counties are using the same equipment without the vendor, so we can sit down and have a

discussion of what issues we've come across. And I thought that was probably one of the best meetings in the 14-1/2 years I've had because it was open discussions. And basically, everybody had the same agenda; we want to make the system work to the best capability. And we came up with a laundry list of things that needed to be accomplished and handed it over to the vendor.

And I think exactly what Paul said, those things are conveyed over jurisdiction to jurisdiction. If I run across an issue, I get a phone call from some other county saying, "Have you ran across this issue?" I probably fixed that bug in one of the programs or did a workaround and I'm able to help them with the system. And so, yes, there is communication between jurisdiction to jurisdiction. And the user groups help, too.

DR. KING:

I think my experience has been that there is information shared among the States, but it's done informally and if you're not a part of that informal network you are not going to have access to that information. And I'm -- as I've listened to your suggestions I'm thinking that perhaps with better organization of that effort and better access by the jurisdictions to that information could provide a real benefit to the jurisdictions, particularly those who don't have a State certification process that may be more reliant upon information sharing.

MR. STENBJORN:

Just leveraging your knowledge, do you know of any formalized process to review the certification standards of each State and at least compare? I mean, because there are apples and oranges

comparisons I know from just my informal discussion when I was in Virginia talking about State certification models.

DR. KING:

No. And I think there's a lot of information out there, but it's primarily shared among a relatively small group of people. Many States will have reciprocity agreements regarding using certifications from other States, but that's almost always at the discretion of the Secretary of State or the Chief Election Official. But it's highly informal and it's uneven. It has a tendency to be denser around certain vendor products than others. But I think it does represent an opportunity for jurisdictions to better manage their COTS issues. And I'm sure you get calls from other jurisdictions that says, "We've run into this. Do you know of another supplier"? And so, perhaps a way of elevating that up out of the informal network into a more visible network would be advantageous.

MR. STENBJORN:

My thinking, specifically, in this context, is how we could leverage -- I mean, obviously there needs to be some changes, some agreements between States to be able to do some COTS level certification. That may be a way to streamline the process for the vendors without necessarily bringing it back through a formal EAC certification, although like for D.C. that would not be -- that wouldn't be relevant because in D.C. our certification is essentially -- we rely upon the EAC certification model.

DR. KING:

Right.

MR. STENBJORN:

And there are many jurisdictions that do that.

DR. KING:

Yeah, I think one of the things that strikes me about this is that there are many, many products in the portfolio of election administrators that are not a part of the certified voting system…

MR. STENBJORN:

Yes.

DR. KING:

...but are, in fact, COTS components and are mission critical components. And so, I think the advantage that it represents to jurisdictions kind of exceeds the scope of our discussion about COTS. But I happen to like those kinds of solutions because there's some serendipitous things that occur out of it.

But I'd like to turn this back now to the vendors about this notion of non-certified -- what was the phrase Paul, I have to look back in my notes, that you used?

MR. STENBJORN:

Retesting without certification. Retesting without certification.

DR. KING:

Yeah, retesting -- testing without recertification. What are your thoughts? What do you see your clients doing out there as they deal with identification of COTS components to marry into the systems? And I know for you that you're kind of looking over the horizon. You're in that reality, I assume.

MR. SMITH:

Sure, we are. And we find that the customers work with us to try and ascertain what will work in a lot of cases. The sophistication of the customers is also apples and oranges even more so than the variations across State certification programs. There's so many counties out there, it may be just a clerk, it may be a clerk and one other person and then up to the New York Cities, LA, Chicago's of the world that have multi-person IT staffs within their Elections Board. So there's just an incredible array of sophistication, or in this case, perhaps lack thereof and lack of technical understanding. So, most jurisdictions will work us very directly to understand, "Okay, I want to install ballot on demand printing. What sort of printers should I select? Will you help me purchase it? Will you purchase it for me?" Maybe I'll go out and purchase it under my relationship with a distributor or what not. But they work very closely with us, even the ones with a degree of sophistication. For one, they want to avoid risk. They want to avoid warranty issues. They want to have some assurance that it's going to work. And we are the technical experts with respect to our systems, so they work with us closely.

DR. KING:

Okay good. McDermott.

MR. COUTTS:

As you say, we are still looking over the horizon on this. And there's certain things, like a printer for printing reports, as long as it manages -- as long as it handles a certain API we're in good shape. In our particular case it's CUPS, which is the printing API for Linux.

But one of the things that I think would be very helpful is, if it, as part of our certification for any given piece of COTS hardware, we make into our certification a test plan for the next -- for another piece -- for the next generation of hardware. When we are presented with that next piece of hardware, whatever it is, we will perform this set of tests in order to determine that it works with our system within the context of what we are trying to make it do. And at that point we will run that test, we will send it to the EAC where they will do whatever it is they need to do with it and everybody is, at least, at that point, I hope, happy.

Another option -- and also one of the things that we could do is compartmentalize the way the software is set up. Separate out different component APIs to libraries, such that we can interchange the libraries within the software and have a similar set of testing.

Again, what really matters here, do we count the votes? Are the votes counted correctly and reported correctly? That is exactly what we need to be looking at, at that end of the day.

To address some of the more communications issues, and I'm not exactly sure who is the appropriate authority for this, maybe it is a Statewide thing, but setting up Wikis that a county can look at. I set one up my -- I set one up for us, but again, that's vendor moderated. That's not necessarily the free communication that people want. So who -- does a State set one up for each of its -- for each of the vendors that are in its State in order to manage the communication within the counties that are using them? And then, how would you share that across the country? It's always about the communication. It's always about the data.

This is one of the big things in the medical community that we're running into. We could be solving a whole lot of problems if we could share common experiences across a number of different patients, but because of privacy we don't. We've got the same issue here. We have too much privacy that people are keeping things a little too close to the chest and that maybe if there was a forum where they could open up that it would not only increase their ability, but it makes my product better too. It makes Ed's product better. We hear back that something's wrong. I don't want to hear about it after the fact. I want to hear about it and that way I can actually do something about it. I mean, it's that interaction that makes the systems better. The systems are not -- they don't come out of the box perfect. Software is only ever abandoned, never finished. And so we, you know, we're constantly moving to try and make them better. And this is the process whereby they become better.

DR. KING:

Okay, good. Pete.

MR. MARTI:

I need to have an understanding of if you hear of a failure does a failure come back to the EAC? How do you know is -- well take an example. You have a Microsoft problem, the system fails. How do you delineate and who determines, "This is a failure," or, "This is a part failure?" Who makes the determination, "We have a problem with this version of software," or printer or anything if the communications -- how does the communications presently work? I don't understand that yet.

MR. HANCOCK:

Right, well the manufacturers are required to report to us anomalies or problems that they have with EAC certified systems after ever Federal election. So we do get those.

MR. MARTI:

Oh, okay.

MR. HANCOCK:

And the check is that we also get reports separately from time to time from election officials, okay? So there is kind of, you know, a double check. We have the manufacturer, and then, we also have election officials coming back to us and saying, "Hey, here's your certified system and here's a problem that I may have had with that system."

MR. MARTI:

Okay, but who makes the determination this is -- you just had a problem with a system one out of 20 that were built or a whole series? That's what I'm saying. Who makes the determination? They come back with a problem saying, "We had a problem with this particular one." Who makes the determination that this was a single failure? Yes, you're going to have them. However, do we have something generic wrong with the mainframe, with the device or whatever? That's what I'm saying.

MR. HANCOCK:

Right, well, we're generally expecting that for -- unless it's an obvious operator error or something like that, we're expecting the manufacturers to do a root cause analysis and let us know exactly what they think the real problem is.

MR. MARTI:

Okay. The thing is that I don't understand the system what you've been working with. So…

MR. HANCOCK:

Let me -- this goes back to McDermott. And I agree, I think what you've proposed is actually a good thing. From our perspective though, something that I just thought of as you were talking about that, something we might want to require from vendors if we do that when you put a system in for certification then you give us a COTS update timeline. That would tell us that you have affirmatively looked at your COTS' vendors, you have looked -- you've communicated with them, you have some idea of when they're going to obsolete their products going forward. And that would facilitate us doing exactly what you've suggested.

DR. KING:

If I can follow-on with that, because I've put it in my notes here, "Test plan for next generation of hardware to be developed concurrently with current model testing." Was that an accurate description of what you're proposing?

MR. COUTTS:

Right.

DR. KING:

Okay.

MR. COUTTS:

Basically, what would need to be tested in order for us to say, "This is -- this still works as expected."

DR. KING:

Okay, good. Luis.

MR. TORRES:

I just want to touch base on what Pete said. After the system's certified, I think it's up to the jurisdiction to classify if it's dead, doesn't work. And when we see a piece of machinery that we deploy, or whatever the case may be, and we deem it that it is -- that it doesn't work, something's wrong with the equipment and we pull it off to the side and then we notify the vendor the serial number, problem, issue and more than likely either they'll send a field service representative to fix that machine or we have to send it back to the manufacturer. So a lot of the issues that arise throughout the election are done at the jurisdiction level to determine that, "Yeah, this particular equipment does not work."

DR. KING:

If I can follow on with Luis' comment to further illustrate the uniqueness of the environment that these systems are deployed in.

As Brian pointed out, the vendors are responsible for reporting systemic issues with the system. The identification and the consensus on whether it's hardware failure or software failure or the ubiquitous human error in the precinct tabulation office goes on behind the scenes. But one of the challenges from the jurisdiction's perspective is not so much the identification of a systemic error but the mitigation of it. And unlike other environments where Microsoft, for example, periodically posts security vulnerabilities in their operating system and, more importantly, provide the patches that should be applied immediately to address it, in voting system management you may not have the

option of applying those patches. So then, it raises the question what good are we accomplishing by the divulging of the vulnerability if our response to the public is, "Yes, we're aware of it and we can't fix it," or, "We won't fix it," or, "It shouldn't be fixed," et cetera. So the management of the reporting of system vulnerabilities, system anomalies, system failures is a complicated one.

And -- but the short answer to your question is the expectation is that the vendors will carry the burden of that going forward. But many of us who are responsible then for answering on-the-ground about these try to work with the vendors to get some lead time prior to the announcement of those anomalies so that we can also concurrently report the mitigations that are in place to address it.

Luis.

MR. TORRES:

Just touching base on what Merle said, our county, we produce a lot of technical bulletins through our vendor. We do a lot of testing. And when we find a problem that is serious in nature, we forward that information to the Division of Elections and then, also forward it to the vendor so that they could spread it amongst the other counties that are using the piece of machinery, you know.

Prime example, 2010 general election, our machines were shutting down periodically for no reason, okay? Sent test information and then shortly after that information was shared with the Division of Elections and also with the vendor, a technical bulletin was released. So that's how we have to move. And you

get to a point that you have to cover yourself at the jurisdiction level, too, because if I'm deploying this equipment and I have a voter up there and the machine automatically powers down, they want to know why that machine is powering down and if their vote actually counts. And instead of coming to the elections office, the first thing they will do is pick up the phone and call Channel 6, Channel 9, you know, local media stations. And, you know, that's where it gets kind of iffy.

DR. KING:

Okay, any other comments on this first question? I want to make sure that I've captured what I heard discussed here. One suggestion was creating a stratification for the COTS components. And you suggested three components to that scheme of systems, peripherals and consumables. And Luis you added…

MR. TORRES:

Software.

DR. KING:

…software as a fourth. We heard testing without recertification, perhaps, and some kind of shared information resource among jurisdictions, but gaining the advantage to the jurisdiction of that information without possibly the overhead burden of the full recertification. And then, heard that test plans for future iterations might be submitted concurrent so that the testing authorities, as well as the vendors, are already looking over the horizon at replacement issues and sustainability issues with that system to maybe improve leveraging of test dollars and test time in the process.

Ed?

MR. SMITH:

I didn't get to make the comment earlier, but it expands on a comment that Brian made yesterday and this morning about upgrading servers within a series without testing, setting up some kind of a list. And I'd like the EAC to consider looking at a broader array of subcomponents for that. LCDs come to mind right away, that over time the panel manufacturers -- it's the same form, fit, function panel but it's maybe the environmental range has increased a little bit, you know, they've used a little bit different materials now that are more in keeping with the technology of the times. We've seen how lead free has influenced the supply chain and integrated circuits and other parts that have a new part number. It's the same thing. It's the same configuration. If you open it up, it looks the same other than it's now lead free and it complies with those regulations could be considered also to be certified to retain the system certification without significant testing, if any. Motherboards, EPROM chips were brought to my attention by another manufacturer as some parts in this potential class of subcomponents that could be taken in without full testing.

And maybe on the frontend of that the EAC develops some sort of a checklist utilizing the VVSG requirements for environmental testing and some of the other clauses out of VVSG to aid the process and ensure some uniformity in the process and ensure that there was some forethought around, okay, what testing does need to be done? If it's a new LCD in a series, maybe all it

needs is radiated emissions and radiated immunity to prove that it's a fine panel and can go into the system without further ado.

So those are some thoughts I had in response to question one from yesterday.

DR. KING:

Ed in trying to capture that suggestion in a small number of words, is -- I think I hear you saying, talking about kind of pre-screening candidate COTS products against the VVSG criteria to pre-identify how they should be categorized, rather than just assuming that because they have a new model number it is, in fact, a new piece. I think the example you used was some of the lead-free manufacturing techniques now are resulting in new model numbers for old products with same function, same fit.

MR. SMITH:

That's correct. But the idea behind the checklist is to ensure that the manufacturer did do some upfront thinking and some engineering analysis to say, "Yes, this really is the same part. No testing is required. Yes, it's the same part, but because of its nature and place in the system, we should do this and this testing and then submit." Or, on the other hand it could be that because of some modifications to the product and its place in the system and its criticality we need to do quite a bit of testing.

DR. KING:

Okay, if I could ask a question first of you, and then, of McDermott regarding kind of reflecting on what manufacturers are prioritizing as part of that.

To me, the suggestion of the use of the checklist to ensure that manufacturers do upfront thinking about lifespan of their COTS components, et cetera, that sounds really reasonable and almost to the point of saying, "Aren't they already doing that?" But from your knowledge of the practices, is that already an ongoing mechanism?

MR. SMITH:

Yes, it is, but I think maybe you misunderstood me. The checklist would be when you submitted a change.

DR. KING:

Um-hum.

MR. SMITH:

So for instance, we went from LCD 1 to LCD 2. It's the same form, fit and function but it's a different part number in the system, maybe because it went to lead free. Maybe they made a slight materials change. You could argue that for purposes of discussions any LCD change needs FCC 15 (b) emitted and the radiated immunity that's found in. Let's just say that that's a ground level statement. Then you would have a -- the checklist would show you would mark those boxes and say, "Yes, we tested those two things. Here's the report. It passed." And the EAC could then accept that. And because there's a checklist and there's some degree of uniformity, it makes life a little easier on the EAC as well, and if the VSTLs are involved them, too. That you know, you know, "Here's all the bases you need to cover." We can scan quickly to see which ones you deem necessary and which ones you did cover and, "Yeah, that makes sense. No, that doesn't make sense." Or, "We'd like to see additional information." So, I think it makes things easier on

everybody because the manufacturers understand a little bit of what they need to do and have something that they can complete and have a work product to submit. The EAC is receiving that and the VSTLs, technical reviewers and such that may be reviewing it or are involved in the testing can start with that work product, as well.

DR. KING:

Okay. And at least, within your firm that would not be considered onerous or undue effort in preparation for testing?

MR. SMITH:

No. It's, as you pointed out earlier when you were thinking that it was an upfront situation, it's something you should do anyway.

DR. KING:

Okay. McDermott is that…

MR. COUTTS:

That is absolutely correct. I mean, just the process of deciding on LCD 2 and whether to move to that is going to require the checklist that Ed is talking about, you need to do that in order to say, "Okay, I'm willing to submit this." I mean, you don't want to submit it if it's not going to pass. If you don't know it's going to -- if you know don't know it's going to pass, you don't want to submit it.

DR. KING:

Okay.

MR. COUTTS:

So, yeah, that's the sort of thing that we do just as part of the decision making process.

DR. KING:

All right, good. Pete.

MR. MARTI:

I just have a question. LCD 1 and LCD 2, is that suggesting a subcategory under the system? Or is it just part of the manufacturing for the particular things, you know, going from model one to model two? In other words, we briefly discussed and proposed four categories. Now does that fall under the mainframe as a sub because its portions underneath -- does each one have associated -- depending on what it is and the complexity, the level of testing that you require whether it's just, "Oh just by process, we go from one to two." depending on what it is. Or it's like, if you do LCD 1 or 2? I'm saying is it part of the main system in this particular configuration or is it considered a peripheral?

MR. SMITH:

No, this is a subcomponent under VVSG and EAC program manual definitions, where you have a voting system which is the combination of everything. A component which could be an optical scan device or a touch screen voting.

MR. MARTI:

Gotcha.

MR. SMITH:

And the LCD facing the voter is a subcomponent of the whole system, being a component of the component optical scanner.

MR. MARTI:

Okay, that's what I thought you were...

MR. SMITH:

So, it's in the device.

MR. MARTI:

In other words, you're proposing subcategory, you know, subcategories to the system because -- that makes a lot of sense because depending on what it is, it has a different criteria on what needs to be tested. It's a difference between someone submitting a whole new system or a change is happening down here and saying, "Okay because it's this, this is the level of testing associated with each sublevel, it's generic," or, "This is what you have to do and this is the timeframe that on a normal system you can expect. This is -- to get it certified it's going to take you this long. But this particular little thing that's part of this main system, all you have to -- here's what you have to do to get it blessed."

MR. COUTTS:

If you're talking about the scanner, this is a critical component. It does not matter to speak to yesterdays…

MR. MARTI:

Like I said, depending on what it is, if it's a critical component. There are definitely going to be critical components.

MR. SMITH:

It depends more on how it's used.

MR. COUTTS:

Yes.

MR. SMITH:

I'll tell you this, a touch screen -- a touch screen on an optical scan device is simply to give the voter messages. And if it has a touch screen, perhaps, they can press buttons and cast their ballot in case they've made an error or they can decide to cast it -- or they

can return it and pull their ballot back. However, on a touch screen voting machine, a DRE, the touch screen is quite important. And so now, if that touch screen is going to change in a touch screen voting machine, I may also want to do -- in addition to FCC and immunity type testing, I may need to redo accuracy or at least some subset of the accuracy of that., whereas if it's an optical scan I just need to make sure it displays correctly. And if I press the button and I have a border of a button, the voter presses it that it accepts that press and does what it's supposed to do, which if the interface is the same it would happen.

So how it's used is important, too. That's why I always say its place in the system. And by "place," not necessarily geographic, but "place" including functional.

MR. MARTI:

Right, right, it all depends on what it is and how it's used on its criticality and the amount of testing. And if the display two, the second one has the same emissions and the safety testing associated with it as the original one, you can say, "Gee, I know it's coming from a good source, because they've got to live up to those." So the qualifications -- it makes a lot of sense and you could cut down on the amount and your risk goes down dramatically. You have a confidence level that when you do take the whole system, put it together and go to a test lab the thing is going to pass because that's been tested, that's been tested, this -- everything that I've gotten in has a level of confidence with it that's been tested to something and it's coming from a -- because they've had to do their homework as a component supplier.

DR. KING:

Um-hum.

MR. SMITH:

That segues into three.

DR. KING:

Okay. I think Paul has a comment before we move onto the…

MR. STENBJORN:

And, actually, Ed really touched upon what my comment was. If we're going to look at some sort of shortcut for recertification of component changes, I would not like to see it based upon form. We talked about creating classifications. Whether or not it's hardware, software, peripheral, et cetera, that's really not what's critical. Ed touched upon what's critical, it's function. Something that may seem trivial, like an LCD panel on an optical scan unit isn't trivial because it actually affects ballot acceptance in the system. So it actually affects specific voter experience. You know, whether or not an under voted ballot should be tabulated or not is going to be driven by whether -- by the message shown on the LCD screen. So, I mean, it's not simply cosmetic, it is actual operational. So I would like to see, you know, the idea of the function being that if we're going to come up with a grading criteria on whether or not something needs to be put through full recertification or can you shortcut it through some vendor certification testing process, it should be classified based on function, not form.

DR. KING:

Okay. Luis.

MR. TORRES:

I think you could take Paul's approach or you could take Pete's approach where you have four different categories. In Pete's approach you could take four different categories and actually have a classification category within those groups.

DR. KING:

Um-hum.

MR. TORRES:

And I think -- going back to our discussion yesterday, I think classifying a class one, class two, class three is the way of going about different components in a system. And once we can identify what class it is, then I think we set up criteria in our testing process to reflect whatever class it is.

DR. KING:

Pete.

MR. MARTI:

And I think as a result of that displaying a system for qualification and requalification to the vendors, I think your communication chain is sharing that knowledge on how you prove and how you're going to work a system and how you're all communicating now, I think you're going to get all the municipalities and everybody to sign up with, "Wow, they're going to reassess what their requirements are." Because I think the feeling that I get that each State thinks they can -- they've got the ideal solution and have to do retests like you do to the extent that you do. Everybody in the whole thing, all the users are going to turn around and say, "This is a lot better system. They have control of it. This is how they're going to control quality." In other words, you're exposing globally how we're going to -- how

they're going to operate. And you're going to get the increased

communication back from them. And I think the amount of testing

required to qualify is going to get dropped, depending on what the

components are, et cetera, if you show the system that you're going

to keep their systems up and running with.

MR. HANCOCK:

That's certainly a potential thing that could happen, but the reality is

that a lot of the differences from State to State and jurisdiction to

jurisdiction are defined in State law, okay? So not only -- you know

the election officials could all agree on it, but if the State

legislatures for some reason don't for some political reason, then it

doesn't really matter.

MR. MARTI:

Agreed.

MR. STENBJORN:

And there are regional barriers to that.

MR. HANCOCK:

Right.

MR. STENBJORN:

The State of Virginia has a very decentralized approach to election

management as far as the localities are given extraordinary

authority. And that's really -- I mean it's -- I'm not going to revisit

history here because it is really historic. It really dates back to the

Jeffersonian ideals that Virginia was upon, that local administration

is best and the State would never mandate that there be a specific

governing strategy to deploying technology to the counties. That

would just never work.

DR. KING:

Okay. I think we've got some time before we take a break to move onto this next question, which is really starting now to tease apart the level of detail. Our last question introduced this notion of function being the primary concern followed by others, and then, perhaps at the far end of the spectrum the appearance of the product being perhaps least important in terms of assessing whether that COTS component should go through certification.

So the question is, what depth do you believe that the EAC should certify to? And the depth there that we're talking about is -- I don't think there's any real debate over vote collection systems or tabulation -- but getting down now to the pieces that deal with the COTS, how far down should the EAC drive the focus and the level of scrutiny to those products. Ed?

MR. SMITH:

Well I'm glad you said what you said in your introductory comment there Merle about there's no question about the vote capture and tabulation devices. I think that's what you said.

DR. KING:

Um-hum.

MR. SMITH:

That's -- I would agree with that because I've seen too many situations where USB sticks, compact flashcards and, you know, devices like that cause problems with the vote collection and tabulation actions because they cause problems with those systems.

You know, but appearance items, you know, I'm going to change the color of my plastic, I'm going to change model numbers, things like that, that are peripheral to the functions of those devices, I don't think so. And the peripheral devices, as I think we're sort of defining here, to a far less degree do I think they require regulation.

But pieces that attach to or a part of the vote collection devices, the voting machines and the tabulation systems, I think they need attention.

DR. KING:

Okay, things that store votes.

MR. SMITH:

Particularly, things that store votes, yes.

DR. KING:

Okay. All right, other comments? Paul?

MR. STENBJORN:

So long as we all have a common definition of what is what peripherals are used to capture/store votes and also assist in the administration of the election because, I mean, the administration of the election is a little bit more than just the voter experience, but it's also the poll worker experience. And so, you know, while certainly we're not going to -- I don't think there will be any debate that any, you know, any media that actually captures vote totals are used for tabulation purposes should be investigated and certified. COTS items that are used for running summary results tapes or communicating the election results to a central tabulation system or used in the production of results in the central tabulation system should also be within the purview. That's how -- those are COTS

products that used in those processes should also be investigated independently.

DR. KING:

By?

MR. STENBJORN:

By EAC.

DR. KING:

By the EAC.

MR. STENBJORN:

And through the VSTLs, you know, that's the current model. I don't want to see those things carved out. For the benefit of -- all due respect to the vendors at the table, I don't want to see those carved out to the benefit of the vendors without the public -- the benefit of the -- to get back to why we do certification is to increase the perceived integrity of the electoral processes on the part of the voters. And so, we have to ensure that those tabulation processes that end up being really the most visible processes to the voter -- to the voting community at large are -- we include them in a consideration of what is a critical function in an election system.

DR. KING:

Okay. Luis.

MR. TORRES:

In Orange County, I had the privilege of creating, designing and building an e-poll solution for Orange County. And I thought about yesterday when Brian was giving us the questions and he gave us an example, that is at what depth should we test removal of media? And when he mentioned that it just brought a light into my head

because when we created and designed this e-poll solution it was driven by a thumb drive. And going back to our discussion yesterday was do you take the less cost of the most expensive or the middle as far as when you look at purchasing a product. Well, we took the less of the cost in purchasing our thumb drives and what we realized when we were doing our internal testing that they used some type of spot glue to sink those chips into the casing, and as our poll workers were inserting them the mechanism was shooting right inside. So they were not reliable. So we had to go to a more expensive type of thumb drive, a more durable thumb drive. And that's the risk factor in dealing with COTS products.

And when I was going over these questions and I was looking over case studies, I want to just -- there was a test of a COTS-based application. And I want to quote Randall W. Rice in his case study. He said, "The bottom line is that successful testing COTS products is possible, but requires a different view of risk, processes, people and tools."

DR. KING:

Okay. Paul in your observation about one of the purposes of certification is to increase public confidence in elections and their outcome, I think that's an excellent observation. One of the concerns that all jurisdictions share is cost shifting and cost reduction for someone else can actually be cost increase for us. And so when we look at the example that you gave, Luis, of thumb drives are COTS components, they meet the common definition, they're widely available, purchasable by the public, essentially, don't change function regardless of the application they're plugged

into, but should they be tested. And I think your case argues absolutely, yes, they should be tested but by whom. And so, part of I think, the smaller question here is not so much, should COTS not be tested, but it's really a point that you came back with earlier today which is non-recertification testing, improved testing to mitigate risk, to increase public confidence in the election, but by whom and when. Do you have any comment on that?

MR. STENBJORN:

If I had the solution to that Merle, I don't think we'd need a two-day discussion about this, because that is really the $64,000 question, is by whom are we going to -- who is going to be empowered, who is going to be responsible for ensuring that these COTS products as they change over time don't affect the underlying system performance. And how many of these things can we carve out from the core system to say, "Okay, these really devolve to the responsibility of the local election officials to ensure compatibility and performance." Because, you know, to be quite honest, Luis' example is a great example of something that will really almost by its very nature devolve into the States and the municipalities to test. So, the dividing line of where -- of what COTS peripherals or COTS systems end up being State and local responsibility is going to be the heavy lifting here to say what's inside and outside of the system. And, obviously, we're going to have -- we have some competing priorities here, although the end result is that the cost will always be shifted to the States and municipalities that purchase and maintain the systems anyway.

So -- but where I would come down on this issue is if something is central to the use of the voting system for either vote capture or vote tabulation, then it should be something that the EAC has the authority and the responsibility to ensure doesn't affect the outcome of the tabulation processes of election. If it's something that is a consumable or a peripheral that is not central to that function, it's something that the States and municipalities should have a process for testing. Unfortunately, all too often, that process for testing is either at L&A or election night.

You know, it just comes to mind, this is something which is certainly external and which the EAC should not certify, but I want to go on record as saying. We have CF card readers that we use to capture results and -- to actually populate election data files into our touch screen voting machines, and then, also to capture the vote files from those voting machines in certain instances. We purchased what we thought to be relatively high quality CF card readers because finding duplicators on the market is very difficult and they're very costly, so we just purchased a series of card readers that were also card writers. All but two of them failed. We purchased ten of them. No, I'm sorry, we purchased five of them and all but two of them failed. And those were the oldest, most expensive ones that we purchased. That's a risk that the election administrators assume; it's a COTS product, you can buy it at Staples, you can buy it online. That should stay outside of certification. However, if that same card reader were integrated into a voting system, that should be certified. And that should --

certified initially, and then, subject to some sort of rigorous testing over time. I think I trailed off.

DR. KING:

No, I think it's very clear what you've identified from the jurisdiction perspective, which is that the management of the procurement process at the jurisdiction level is extremely complicated because of local rules, traditions, aggressiveness of election officials to get in and explain why the lowest bid component may, in fact, not be suitable for the application. But I think your point about making sure that the context of that COTS component is a part of the evaluation, that if it is embedded into the vote capture, embedded into the vote tabulation, that elevates the risk to the jurisdiction and it may elevate it beyond their level to mitigate effectively.

MR. COUTTS:

Well, that actually comes back to my earlier point about having a predefined test plan as part of the certification of any peripheral because again -- and depending on the context of that peripheral determines what -- who can run that test. It is our responsibility, as vendors, to track our components. I mean, we can call them COTS, but ideally a county should come to us and say, "We need more of "X." What's the next version of "X" that we can get?" And we should be able to say, "This is what we've been looking at."

Now, one of the big lead-up items for any testing plan -- or testing campaign, regardless of whether it's at the VSTL, or for us, or at the county, is what we doing? What is the plan? Well, if we make the plan part of the certification and we say, "This is what you need to test in order to make sure that this component works," then

we've probably cut the amount of time in half. I mean, we spend more time putting together test plans than we do actually performing the tests. So this sort of upfront determination of what is the critical function, what is the context of a device, defining that upfront is going to make the entire process so much faster.

And who determines it? Well, we could set up our classes. We can say, "This is a printer of reports. We're creating PDFs and we're going to use this printer to create reports." Well, heck, if it doesn't work directly with the system, we'll carry it over to a Windows system and it will print the PDF just as well, and we're not going to have to worry about it. "It's a scanner, we're casting votes." Okay, well, now this is serious. This now needs to go back to Wyle and they're going to run a full test about it.

MR. MARTI:

Different test.

MR. COUTTS:

So -- but again, having those test plans predefined is an absolute critical point, because it is so much of what goes into how do we do it and what so much of the delay is about.

DR. KING:

Okay, well, there may be some more to talk about on this particular question, but the 10:30 break is upon us. So I'd like to break for 15 minutes. And when we come back to the table, I'd like to pick up where we left off on this topic.

Thank you.

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[The roundtable panel recessed at 10:32 a.m. and reconvened at 10:50 a.m.]

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DR. KING:

If we can go ahead and come back to the task at hand. I'd like to welcome on conference call, Glenn Newkirk. Glenn, can you hear us?

MR. NEWKIRK:

I can hear you just fine and I've been able to watch you just for a few minutes on the Website, as well.

DR. KING:

Great, well, welcome back this morning. We're in the process of going through our homework assignment from last night and we had gotten into the second question, which was, at what depth do you believe the EAC should push the certification of voting systems down to, if you will. And one of the examples that was given is that of a thumb drive, a USB drive, should that be included in scope, out of scope, what are the issues associated with that. And that's where I'd kind of like to pick back up the thread. And Glenn, we know since you're not here you won't be able to raise your tent card, but if you will just call out, we will welcome your participation in the discussion.

So, let's kind of quickly recap where we left off prior to break in the discussion. I think Paul had illustrated that the function is an overriding concern; where that product sits into the voting system. And Luis had actually provided an example of how a thumb drive issue is; on the surface it might appear like it's a trivial decision on the part of a jurisdiction but, in fact, turned out to be more complex and more mission critical than at first anticipated.

Are there other examples that might kind of help us bracket in this discussion about what should be subjected to detailed testing, what perhaps the testing can be waived or shortened, that may be of interest in giving the EAC guidance as they review this discussion going forward? I know -- we had an earlier display of the Unisyn system. It had a Dell PC. Could we have it back up here? If we can raise it to this point. And Glenn, what we're looking at is a generic description of a Dell OptiPlex PC. Are things like monitors for the tabulation server, are those COTS products?

MR. SMITH:

Sure. You're going to buy them and anybody could buy them.

DR. KING:

Hard drives?

MR. SMITH:

They're COTS.

DR. KING:

Keyboards?

MR. COUTTS:

Yes.

MR. STENBJORN:

Yes.

DR. KING:

Mice? Barcode scanners? McDermott's wrinkling his brow. He's got to think about that.

MR. SMITH:

But you're -- if you unwrap -- do you need to test them, what is COTS is I think fairly easy to define. Where you get into trouble is

okay then, what do you do with it? I want to incorporate this upgrade or this new thing into my voting system. What do I do with that? That's where it gets tricky. And COTS, yes, we could come up with a definition. There are obviously definitions that exist, agree with them or not. But those devices that you've called for RAM sticks, sticks of RAM to update -- I guess there's a RAM specification up there -- CD drives, those are all COTS products. Anybody can order them through commercial sources, retail sources, what not. But some stores will sell them to you and other people outside of the voting industry, so it's a COTS product.

MR. COUTTS:

As long as they meet the specifications required by the computer itself and you can't change the clock speed of the RAM.

MR. SMITH:

Oh sure.

DR. KING:

All right.

MR. COUTTS:

But as long as you're within those specifications, you're in good shape.

DR. KING:

Okay, any other observations on the depth of certification? We often use the expression "pushing down" the testing with the implication that we're pushing down to greater and greater levels of detail.

All right, if not we'll move onto the next question in the homework which…

MR. NEWKIRK:

Merle?

DR. KING:

Yes, Glenn.

MR. NEWKIRK:

Merle, I apologize if this has already been discussed, if we are on the second question, and if this has already -- this level of generality has already been discussed, I apologize, and we can move on. But I kind of suggested a general rule -- again, I think somebody there made the point that all of -- a lot of the things you talked about are COTS. The question is, what do you do with them? And in answer to your question of, at what depth do you believe that the EAC should certify to, and I presume that means and test to, as a general rule it appears to me in order to provide the level of confidence that you want to provide in the system, and this is kind of a crudely worded general rule, but if a device, whether it's COTS or not, if it captures, stores or transmits in the process at any point election management data, voting data or voting results, it appears to me that it should be tested and certified. That when you create a spectrum, like we talked about yesterday, those devices will almost always fit into the highest, most critical class of COTS devices. And if you were to carry out that -- and I realize that for some items that goes down to a very low level of granularity, for others not so much, but it would mean that things like monitors, things of that nature, would probably be ruled out, by and large, from testing and certification, could be. But it appears to me that if you did that level of granularity and made the results of all

those inspects at the EAC VSTL level available to the State and local election authorities, that would go a very long way at "A," letting the vendors know what is in scope; and, "B" setting up that level of confidence that you're after for the State and local election authorities to know exactly what they're getting and what has already been looked at.

DR. KING:

Okay. Glenn, can I ask you to repeat – at the very beginning the volume was a bit low in here, but I think you used a three-component phrase of capture, tabulate and communicate EMS…

MR. NEWKIRK:

Basically yes. Yes, basically I -- and in fact, I like that phrasing better Merle. I had used captured, stored or transmitted. I think storage is an important component to put in there, because there's certainly a level of security in stored data. For election management data out there, of course, I'm referring to the election set-up data. Voting data and voting results, you're right, I like your phrasing actually better.

DR. KING:

All right, so from that criteria, then, if, let's say, a USB thumb drive were used to store EMS data, I'll give an example, where on election night a jurisdiction may be prohibited from connecting their tabulation server to a network, but they may move data to a thumb drive, and then move that data to another device. Glenn, would you consider, then, that thumb drive to be within scope of that EMS storage?

MR. NEWKIRK:

Yes.

DR. KING:

Okay. All right, very good. Paul, do you have a comment?

MR. STENBJORN:

This is where we get into -- there are obviously contextual differences, yes, because Merle, the exact process you described is what we do in D.C. We have our election tabulation system where we plug a thumb drive into the EMS and we transport the data into our network system so we can release the results.

I can't -- what -- but the question is, what is particular about the function that is in that transfer of votes to the election sphere? Is there something specific in the way in which it's capturing those data and transmitting -- now we want it to work, obviously. I mean, the goal is to have an operational thumb drive. But, when I'm thinking about context, I'm thinking about context that is -- that's unique to the elections management sphere and not just in data transport. Because I think these are some of the dead ends that we face as local election officials in trying to buy equipment and trying to upgrade our equipment and trying to maintain a relatively robust system in planning for an election that it would be unduly burdensome on a locality to say that -- on a jurisdiction, if we were to say that there are -- you have to purchase a certified version of a USB stick in order to perform this function or a certified DVD-ROM to burn your results to a disc or -- because then, you know, to take it back a level, this is where we actually have gotten into actual cost issues with election management.

The PCMCIA cards that are used in our optical scan systems, we can't purchase them from anybody. We have to purchase them from the vendor because they're certified, which they should be. They should meet a specification. It would be really nice, however, if as we have been talking, there was some testing regimen that we could put these -- that we or the vendor could put these things through to open up the spectrum to help drive the operational costs. Because what the effect has been and is that we didn't purchase spares because we couldn't afford to purchase spares. So, we were essentially flying without a net. We had five spares for 143 precincts, plus our early voting sites. And that wasn't sufficient. But it was what we were able to do from a cost standpoint.

So when we're considering these standards, it would be nice if a testing standard could really look at the context in which it was managing data and where it was specific. I could certainly make the argument that a PCMCIA card in an optical scan unit was very specific to the election context, but a USB stick transporting text files from a -- from one PC to a network -- a network PC is not specific to the election management process.

DR. KING:

Okay.

MR. NEWKIRK:

Paul?

DR. STENBJORN:

Yes, Glenn.

MR. NEWKIRK:

Yeah, I agree with you. I think possibly the solution to the issue --

and let me tell you what the context was I was using in that kind of

a rule of thumb, and that is the context issue is that critics are so

vocal about lack of security.

MR. STENBJORN:

Yes.

MR. NEWKIRK:

And, you know, I think overly so in many instances but,

nonetheless, it's there. It's the issue of confidence of knowing that

everything on which voting data are stored and moved around that

it has some level, some look, some back-up procedures of testing

and documentation that are there.

Now, one solution to the problem, Paul, I think, is to -- is for

the EAC to encourage or require, or for the State and local election

authorities to look more favorably on vendors who actually will

certify more alternatives of devices. I agree with you completely,

there is nothing that rankles me more and rankles my clients more

is when all of a sudden there's the proverbial $5 thumb drive that

costs $35 when the vendor provides it. When, in reality, what you

really want to see is the vendor telling you that there are five or six

thumb drives, or ten thumb drives, that have gone through the

testing, and it doesn't take long for those kinds of devices to go

through the testing, and to state that they are truly COTS and that

you can go to Best Buy or Staples, or wherever, and you can pick

those up on your own because they have been certified as to fit.

So, again, part of the context is to increase the overall level

of confidence that the media and the election observers and the

election officials have, that you are actually using the devices that have been spaded as fit-for-purpose in the election context.

DR. KING:

Okay thank you, Glenn. If I could reflect Glenn's observation back to the vendors. Is that a current practice? To what extent does that shift burden onto the vendors as they're preparing a system to go forward to provide that kind of alternative approach? And Glenn, I think yesterday you pointed out that some of the things that we talk about, in terms of managing COTS components, are, in fact procurement issues at the jurisdiction level. Or Paul, you pointed out it can be a part of engineering the RFP so that it's a requirement. But from the vendors' perspective, how would that shift the burden onto the vendors, in terms of preparing a system for testing?

Let me start with McDermott, and go to Ed.

MR. COUTTS:

Well, again, the -- it comes back one of the issues we discussed yesterday is that when you create that split in the testing campaign at a critical point, then you suddenly have expanded your testing to a significant degree. And, you know, if you go through the entire testing process with one device, and then you come back and say, "Okay, now here we're adding another device and we have defined the scope of the function of that device," that becomes a much quicker process than trying to spread it across multiples.

So, when you're going in the first time, you're actually better off with one in the current situation.

Now -- and, you know, in some of the cases, honestly, the burden of cost comes up, as well, because the vendor then needs to -- we need to pay for the testing of the alternate. Now, if the counties would like to pay for the testing of the alternate, then that takes a lot of the onus off of us, to be perfectly honest. So that tends to open it up.

DR. KING:

Okay. So if I can summarize McDermott, that the potential complexity of the testing, because of the variety that's being introduced into it, could be a favor but that depending upon the perceived value of the process it may be something that States or counties may want to piggyback onto the VSTL testing and require those tests themselves?

MR. COUTTS:

Um-hum.

DR. KING:

Ed?

MR. SMITH:

My comments are similar in that, you know, we do bring a limited number of additional brands or models of COTS things to the table at our VSTL testing, but after awhile the number of test cases just gets to be unmanageable and untenable relative to cost. So that is the limiting factor. But we do recognize that, you know, sub-vendors to us can go out of business, models change, things are up to date, you know, in very rapid sequence, as we discussed yesterday, and so we do need and we do bring some additional models of COTS products to the table where it makes sense. And

that not be true for a high-speed central scanner where we just bring one that's a very high speed and maybe one that's a scaled-down version for smaller jurisdictions, but things like the memory media we'll bring a few models to the table.

But then, you know, because of their criticality in the system, the VSTL may determine that that needs accuracy test, that that needs to be part of volume and such. There are some smart ways to incorporate that and there are some very blunt-force frontal assault ways to incorporate that which is simply, well, if you bring two compact flashes we have to run everything twice. On the other hand, the smart way may be that, well, you know, some of these we can do half of the units with this flash and half of the units with that flash and only run the test once but still give us sufficient coverage across the two compact flashes. So there are ways to attempt to manage that. But in some cases, the lab deems that, you know, we have to run it twice because you brought two things.

DR. KING:

Okay. And Brian, if I can ask you, in terms of the VSTLs working with vendors to optimize the testing of multiple alternative COTS components, do you have a sense of what the degrees of freedom are there in terms of the opportunities for the VSTLs to drive down the cost?

MR. HANCOCK:

Yeah, I mean, we're certainly willing to work with the VSTLs. I mean, we always, you know, go through a plan of -- a process of approving the test plans, test reports. And we review test cases as

well. And so there's ample opportunity to have a dialogue, you know, on those types of issues.

DR. KING:

Okay, very good. Well, let's look at the third question then. What --

I'm sorry -- would increased scrutiny of the manufacturing process by the EAC allow for relaxing of constraints on COTS integration?

And my question -- first question Brian to you, on this is, we're talking about scrutiny of the voting system manufacturing process or of the COTS manufacturing process?

MR. HANCOCK:

Well, I guess it would be both. But I mean, potentially, you know, we could either you know -- we, right now, take a look at the manufacturing facilities for the voting system manufacturers. We could work in conjunction with the manufacturers to take a look at their COTS providers, you know. There's a number of things we could do in that area. I think the question is, you know, would that additional level of scrutiny mitigate some testing.

DR. KING:

Okay. Let me begin by making an observation on that, based upon an experience that we had in Georgia. We use an electronic poll book that requires compact flashcard and the -- at a very high level, it's a Type II card. And, as our voter registration list has grown, we had to migrate from two gig to four gig cards, and as we worked with providers of compact flashcards, looked at a couple, talked with the engineers, and were assured that the application would fit and discovered that the architecture of the cards had changed. And given the typical application for compact flashcards

photography, the manufacturer was confused about what we were trying to do with that card and that the architectural change impacted our application. And when I read this question, Brian, that was my thought about how challenging it is in working with manufacturers of COTS products who I think do make an effort to understand the applications that their products are going to find their way into, but also don't have a detailed knowledge of every product out there that is a candidate/recipient of, in this case, the compact flashcard.

So that's where I kind of thought, you know, would increased scrutiny of the COTS environment help or mitigate in any way? Or is there just too many of them, the applications are too fluid? So, that's an experience that I reflected on that seemed to argue -- that I would have trouble arguing that an increased scrutiny on that particular industry would improve the likelihood that those COTS products are going to integrate well.

But I'm interested in other examples, and maybe, that's an extreme example. Brian?

MR. HANCOCK:

Well, and the other point to follow-up on that is given the relatively small nature of the election industry, would those COTS manufacturers be actually willing to have that level of working relationship with either the voting system manufacturers or the EAC and those manufacturers. So, that's also a question.

DR. KING:

What about a better understanding of the manufacturing and integration process of the vendor?

Ed?

MR. SMITH:

And that's actually how I interpreted the question, probably

because that's who I am that, you know, vendor certifications, as

McDermott alluded to ISO, or capability maturity model, CMMI, QA

programs at the registered manufacturer, the vendor, could help the

EAC through the process where there's some points of subjectivity.

As we heard from the FCC, yesterday, not all of it's cut and dried;

either technology evolution or you just can't write a rule for every

single possible circumstance. And they may, you know, tip the

scales in favor of manufacturers who have demonstrated a higher

degree of sophistication and concrete testing and engineering work

towards the application of COTS in their system.

DR. KING:

Okay.

MR. COUTTS:

Part of our -- part of the technical data package is your internal

keyway procedures and your test plans. Everything that we do in

order to determine that a piece of hardware that we've chosen to

give to the VSTLs works the way we expect it to, is all right there,

as part of the technical data package. So again, I agree with you

Merle, I have a hard time seeing that an increased scrutiny in that

area is going to have a significant impact on what is truly a upfront

rather than a backend process.

DR. KING:

Pete, in the manufacturing arenas that you interface with, what --

Ed had mentioned CMMI and ISO certifications. What is your take

on the degree of confidence that we should take away from those

kind of certification to third party provider of components? And are

there other certifications that would be of interest to the EAC?

MR. MARTI:

I think, for example, the ISO 9000 process, I was -- when I was at

Digital I was one of the implementers of the system within one of

the facilities up in Boston, and I got very involved with the ISO

9000. I was an internal auditor of the system and am very familiar

with that. I think that if a manufacturer has as an ISO 9000 system,

that is a definite plus because behind ISO 9000 it's, "Do as you say,

say as you do." And they have to have every single process

documented on exactly what they do. And the people on the floor

have to do exactly -- there's written procedures on exactly what

they can do. They have definite control any ISO -- any quality

process. There's also processes but the prominent one worldwide

is ISO 9000, which has been accepted very heavily in the United

States which have the accreditation as a manufacturer. There's

different classifications depending on what the manufacturer does.

But it's a system that -- there's a definite plus having -- especially

being accredited ISO 9000 because they've been investigated and

are audited on their processes all the time. And they -- the

consistency and the ensuring of the quality is there of their

processes that ISO 9000 provides being accredited. That's an

affirmation. It's definitely a plus for any manufacturer being

considered to produce a system.

DR. KING:

Okay, thank you.

MR. NEWKIRK:

Merle?

DR. KING:

Yes, Glenn.

MR. NEWKIRK:

I would add that, again, because these systems deal with such
sensitive information and because they're under such scrutiny that
vendors who have some type of security certification, as well, for
their security management processes in their companies, that
would also be a plus. It was something I would look at very
favorably in, again, the procurement stage. Whether it would be a
requirement for EAC certification or not, that's a different
discussion. But, certainly, it's valuable to have the ISO security
management system certification.

DR. KING:

Okay thank you, Glenn. Brian?

MR. HANCOCK:

Yeah, just personally I am not a huge proponent of -- necessarily, a
huge proponent of ISO 9000 certification in the election industry for
two primary reasons. For the size of these companies, it's a very
expensive certification, it's an ongoing certification and it's an
additional ongoing cost. But, more importantly, what it truly tells
you is that, "Yes, you are certified, you have a process in place."
And, as Pete said, you follow your procedures explicitly. That,
however, does not mean that those procedures guarantee you a
quality product. It just means that you follow those procedures.
You, potentially, could have quality procedures where you have 30

percent failures. As long as you have those procedures to continue to have 30 percent failures on the assembly line, that's what you have, and you're following those, and you meet those and you would potentially continue your certification.

DR. KING:

Okay. Ed.

MR. SMITH:

And, Brian, you're right and that criticism has been leveled at ISO for many years and it has a basis, in fact. I will say, in the defense of the ISO organization and the committees in the U.S. and other countries that roll up to it, that in the later -- the latest version of the ISO 9000 standard, they have worked to address that by incorporating some voice of the customer and some external measures such that it doesn't become the, as criticized, paper mill and as you said -- or the same criticism and made the same criticism, that you can produce a lot of junk as long as you document your junk producing process. They have put in some requirements to eliminate that possibility and, thus, that criticism.

DR. KING:

Paul.

MR. STENBJORN:

The question is, will there be benefit in the EAC providing greater oversight to the COTS providers themselves either through the manufacturers or directly to the COTS. I strongly agree with Brian's assertion earlier that there may not be enough weight to the election community to really have any influence over the Toshibas and the Samsungs of the world.

I also wanted to further identify, the idea of the ISO certification as being some ISO or CMMI certification to be some sort of shortcut of doing -- of performing actual EAC certification of components I would highly disagree with because they measure something completely different. I mean, the measurement that is relevant to the election sphere is whether or not there is consistent vote tabulation from the systems and that there is some guarantee or some -- that there's some assurance that can be given to the voting public that the voting equipment is consistent and auditable, which is a very different measurement than I SO does or CMMI does.

MR. SMITH:

True, but I'm looking at it strictly in the context that you have some assurance that the engineering processes used to get to those characteristics and attributes that you list, which are true, is more robust than someone who cannot meet those requirements, does not meet those requirements, can't display a CMMI or an ISO certificate.

MR. STENBJORN:

And I think that is relevant when it comes down to the RFP process within the purchase of this equipment to prove the integrity of the manufacturer, but I don't think it comes into play in certification. I -- you know I think it -- I mean, that's really the responsibility of the vendor -- the customer/vendor relationship and not on the certification of the efficacy of the voting process, which is really what I perceive the EAC's mandate. But I don't work for the EAC.

DR. KING:

I'll weigh in a little bit on, not so much the ISO 9000, but in general, advantages that are gained from organizations that are willing to open themselves up to external review. And I think -- and I hear what Brian is saying that if all that drives you towards bad product, that's not the intent of ISO, but because so much of what we have to do in interpolating data about organizations and trying to infer the quality of the product that might come out, there is an awareness or at least an appreciation I think that organizations that are willing to engage in that kind of internal documentation, the peer review, the self-review, that they may be good partners for getting additional from because of already demonstrating an ability for that. So I think ISO 9000 and those types of designations are a plus.

But I think what I heard yesterday was that when we look at the products themselves, whether they have the CE designation, the UL designation, that there's two different levels of inspection here; one is of the organization and one is of the product itself, and we may be interested in the interaction between those two domains, but at the end of the day it has to be the product that meets the quality requirement coming out. And, therefore, using ISO perhaps as an additional piece of information on that firm benefit but cannot replace the actual integrity of the product and designations of the product.

Pete.

MR. MARTI:

ISO 9000 doesn't change the quality of the product. It's the quality of the system. For example, doing a rev change in the design or specing a new part in, the manufacturer is driven because of the

ISO 9000 process to put in the right change request, make sure that whole process of change is documented and known. It doesn't have to do with the quality of the product. That's really -- quality of the product is left to the engineers to determine what it is and then the manufacturing people to put into place the manufacturing processes to get the quality of the product. But ISO 9000 is internationally recognized and it's a system that's out there, and it's understood it all depends on whether you can afford it. And you can get -- you can have just your manufacturing facility qualified 9001 I believe, 9002 your engineering process and your manufacturing process documented. But it really -- the quality of the product says -- you put ISO 9000 in place. Number one is going to be the same thing as number 20 or 500. This is what they are addressing is the whole process of the documentation stream. That's the whole purpose behind it, not the quality of the product ISO 9000 does not really address. But it says something about your manufacturing facility that you've got -- I can't make a change in a process without filling out the right form changing a chip, changing a flux, changing whatever you want but it gets documented what happened. So if it's got to be looked at it, it's documented and that's what that process does and -- depending on the size of the manufacturer whether it's required by what you're building and what market that you're addressing because it's required by a lot of markets that you be ISO 9000 approved. That's just one system. I wanted to clarify that…

DR. KING:

Okay.

MR. MARTI:

...for ISO.

DR. KING:

Any other observations on that question? Okay, let's look at the last question in the homework.

Who should be eligible to certify to the EAC that a COTS component is in fact COTS? What criteria should be included in that determination?

Yesterday, we heard some discussion of self-declarations on the part of the vendor. That was extended to jurisdictions. Can jurisdictions declare that a component is COTS as a part of an engineering change order? But I think what we're attempting to do here is kind of drill down a little bit into the detail and look at the implications on cost of testing, duration of testing. So let's look at it, if we can, start from the vendor's perspective. When -- and we've still got this chart up here. So the good news is we're using the Unisyn system. The bad news is you're first out of the chute, in terms of discussing this. Obviously, this document places those components as COTS. And I'm presuming that that was an assertion made on the part of Unisyn when they submitted the system…

MR. COUTTS:

Right.

DR. KING:

…and affirmed by the VSTL and subsequently the EAC.

MR. COUTTS:

Right, and what you're looking at there is a description of what was purchased and sent to the VSTL as part of the testing campaign. And so, that is exactly there what we test it on. So we know that works.

DR. KING:

Okay.

MR. COUTTS:

Absolutely, without a doubt, we know that works because we ran, you know, some huge number of votes through everything that's on there.

Again, I think we come back to our spectrum analysis as to who should be able to certify. And personally, I would love to be able to say that one of our sub-manufacturers could certify one of their products with our system. But part of the issues comes into the fact that we are required to submit an end-to-end system. Since we are required to submit an end-to-end system, there's not a whole lot of leeway for components. Nobody can submit a new piece of hardware without the cooperation of the manufacturer, because we need to give them everything else that is required to surround it and give it context. So that creates a bit of challenge around it. I would love to say that the counties could come in and say, "We have a new printer that meets the specifications that are defined in here and that we want to renew this," and have a set test plan to go and have that taken care of. But, again, does it fit within the context, as well as within the specifications? This is the challenge. So, the way it is currently set up, it does require that the manufacturer be part of the process.

DR. KING:

Okay. In this particular system, when you proposed that the OptiPlex device would be considered COTS, was there any discussion on that with the VSTL of whether it should or should not be?

MR. COUTTS:

That's -- again we're talking about context here because those particular devices are back-office systems. They are not in precinct. In precinct and back office are two completely different environments. In one case you're picking up the machine, throwing it in the back of a car and going over some bumpy road and then putting in with -- into a place where they plug it in next to a microwave oven, and that happens, as opposed to something where you're actually in the central count location. Is this a device that is accounting votes or is it accumulating votes? This is, again, context. The devices that you're looking at, they are specifically back office not counting votes systems.

DR. KING:

Okay. In this -- the context of this particular test, could you share with us any examples of items that their status as COTS components was not a consensus decision immediately in the process, that there may have been some discussion about whether it is or is not?

MR. COUTTS:

I cannot recall any. That does not mean it didn't happen.

DR. KING:

Okay. What I'm looking for, maybe Ed you can provide us with examples, is some sense of the kind of dialogue that might occur at the VSTL level between the vendor and the VSTL about whether a component is COTS or non-COTS and how that was resolved.

MR. COUTTS:

In some cases it was somewhat irrelevant because, again, when you're talking about an in precinct device you are still going through the full gamut of testing. You are shaking it, you are baking it, you are freezing it, you are doing all of the environmental and emissions and all of the radiation tests that are required regardless. So that kind of takes those out of consideration in that respect. So when you talked about back offices, basically, if they could order it and have it delivered to them without us touching it in the meantime that kind of made it COTS for them.

DR. KING:

Okay. Ed.

MR. SMITH:

I don't have an example Merle, whether t was contested, but I do have some examples in software where it was checked thoroughly. I use the Linux operating systems for instance. Did you modify it? Did you did not modify it? Can I get it off the Internet? What version is it? Is the versioning maintained? Those sorts of questions emerged. And I guess, there could have been contention, but everything checked out so there was not.

But the hardware, for better, for worse, it seems like the manufacturers and the VSTLs know -- kind of know it when they see it. And there are some safeguards, like McDermott pointed out

one yesterday, on high-speed optical scanners where you send the scanner directly to the VSTL without the registered manufacturer touching it. And so, they know it's something that could be purchased. And the obtaining of the tools and portions of the software that's ultimately built and placed into the voting system directly by the VSTL, once again, with no vendor involvement other than to tell them where to get it and how to incorporate it through the build process, has some safeguards to ensure that what is asserted as COTS is indeed COTS.

So, to answer the question, who can certify, which is very close, also, to who can assert that something is COTS, I would sure like the manufacturer to be able to, especially for certain classes of components. That ubiquitous 17-inch monitor, I think, I should just be able to come up and say it's COTS. Maybe there's even some class where there's not a question, you know, that a computer monitor is COTS. If it's available commercially, it's COTS, period.

Now, that's my thoughts. And for some situations I think there will be a requirement the VSTL certify -- somebody else may assert -- but the VSTL is going to have to certify that something is COTS because there's going to have to be some level of investigation, software in particular, maybe not so much hardware.

DR. KING:

Okay. Brian.

MR. HANCOCK:

Yeah, I just wanted to give some additional context into what we're talking about, into sort of some real-life situations that we've run into, as far as determining whether specific items are COTS or not.

And it generally isn't the, you know, the Dell laptop, you know. I mean, some of things are pretty easy. Other things are not quite as easy as you might think.

We have run into a situation where we ran into some memory cards that were asserted to be a COTS product. The memory cards, we did some investigation, they were failing both at the VSTL level. And we did some additional testing and found out there was some failures at the jurisdiction level, too. The failures were because the glue that was used to keep those cards together was failing and they were separating and causing some issues. The manufacturer, while they did have a Website and it was ostensibly a commercial manufacturer, it wasn't one of the ones that you necessarily would see every day. So that's one option.

Another issue that we run into is a modified thumb drive. The form of the thumb drive, not the function, but the form was modified to fit a specific application in a voting system, right? So, the edges had to be filed down so it would seat itself correctly in that system. So, you know, nothing within that thumb drive was modified. You could go to Best Buy or wherever you want and pick it up, but without that simple filing down of the corners to fit in there, it wouldn't work. So, it really isn't COTS.

So, there are sort of some very concrete issues that we've run into as far as products that you generally might think should be COTS but aren't necessarily always.

DR. KING:

Luis.

MR. TORRES:

And I just want to touch base on what Brian says, because we experienced some of those same issues with the shavings of the thumb drives at the jurisdiction level. And we don't see -- we see more of the MOTS, where we have to purchase our products through the vendor, plain and simple. Even if we know there's a compatible device that's out there, it becomes a reliability issue to the jurisdictions. And it also becomes a warranty issue, like we talked earlier, because the manufacturer will void your warranty in the process of using another particular device. And then, it becomes a blame game, you know, "Well, you didn't purchase this particular CF card thumb drive from us. You went out and purchased your own." And because of the shave issue, or whatever the case may be, it could be several different issues on the table. Because we didn't go to the manufacturer and purchase it, now we're the ones to put the blame on. So, it's a blame game.

DR. KING:

Right, it certainly can be. Ed, I want to come back to something that you said about, in specifying components of the system requiring the VSTL to order product directly from the third party vendor. That's an interesting way to demonstrate that it is, in fact, a COTS component. And I like that. But my question is, does the voting system vendor specify the third party vendor in addition to specifying the product? Or is the VSTL -- does the VSTL possess the discretion to order from a third party supplier other than whom is specified by the voting system vendor?

MR. SMITH:

No, we specify in the build documents, "Go here, and get this file and incorporate it." And just to be clear Brian, we're kind of smiling at each other, that's a requirement. It's not at the manufacturer discretion. The VSTL must go and obtain those third party components if you can get them, you know, online or commercially today. And if it's a very older system and the manufacturer has a copy of it, then they have to do some assessment work to see that, "Yes, although we got it from the registered manufacturer, is it truly from a COTS source? Or was it back in its day for the really older stuff?"

DR. KING:

All right, good. McDermott.

MR. COUTTS:

Right, I mean, in the build documents not only do you have say where you get it, but you also have to say, "This is the expected check sum value," so that you can verify that this is indeed exactly what we are expecting at the end of the day. I mean, that's one of the processes that's required is that we need to be able to verify all of the software, not only as part of the certification process but afterwards. We need to be able to verify all that software. And a process needs to be in place to do that.

And as far as ordering the hardware, there is not really any discretion. We have to -- generally, we order it and have it drop-shipped directly to the VSTL, or have it drop-shipped to the customer, depending on how you want to -- what stage we're in.

DR. KING:

Okay. From the jurisdiction perspective, I think Ed said that would like -- the voting system vendors should be able to attest to the COTS nature of the product. But when we're dealing with ECOs, and perhaps even when the vendor has chosen to no longer support additional extensions of the product, or extend the life of the product, where can the jurisdictions go when they're looking -- or how -- I should say how can the jurisdictions proceed in attesting to or gaining attestation that a component is a COTS component and comparable?

MR. STENBJORN:

Well, currently, we rely on the vendor. I mean, there really is not a third -- there aren't third parties we can turn to and say, "Research what will be compatible and what won't violate either the warranty or the existing certification." There are no other -- I mean, again, we're working with very limited resources. I suppose, in theory, jurisdictions could do the necessary research of what the certification package was and find comparable or find things that would be -- find things on the market, especially when we're talking about like software libraries. I mean, in theory we would acquire them ourselves. But in practicality, as you know, working in Georgia, the local officials don't really have the capacity to do that. And so, all who -- in the myriad of instances that I'm familiar with, jurisdictions rely exclusively on their vendors to supply them their COTS product.

DR. KING:

Okay.

MR. TORRES:

And to touch base on that, the information is not disclosed. I mean, we don't receive a list saying that these are COTS products, you know. We have to do our own research. And like I said, like Paul said, it takes time. It takes time for the local jurisdiction level to do your own research and all that. Do we do it in Orange County? Yes, we go out there and we look for different devices. But we do not use them unless we get the blessing from the Division of Elections in Florida.

One example, we've been trying to push our vendor to look at a heavier paper stock. And we think that the reliability of the machine would actually work better using a better -- a heavier paper stock. We have to use what we have to use, right now, because it's certified with a certain poundage. So, you know, it's -- we do that because we want to make the vendor look good, but also, we want the machine to function correctly.

So, yes, it's a resource issue. It's a dollar issue. It's a manpower issue. It's all of the above.

DR. KING:

Okay, well, I heard Paul say that the vendor has an integral and ongoing role in certification of alternate or replacement components for the system. And in Florida, you have the Division of Voting System Testing. Do they manage that relationship between the vendor on assessment of COTS replacement? Or does the jurisdiction manage that vendor relationship?

MR. TORRES:

I think the vendor -- I mean, the Division of Elections has to, because if it's -- it has to be certified -- it has to go through the

certification process. And, you know, we can't go out there and just purchase it. We have to go through the vendor that has been certified through the State.

DR. KING:

So, on issues like replacement batteries, those kinds of things, it has to…

MR. TORRES:

It has to -- it has to go through the vendor.

DR. KING:

Okay, very good. Any other comments about the homework? I'm giving "A's" to everybody who turned in their homework today. So, we do appreciate it. In fact, Brian and I were talking that this is -- this may be an ongoing feature of our panel discussions in the future. I thought it was very, very productive. And this morning's session I think got us closer to getting to the level of detail.

And I was explaining to Luis that one of the challenges on this particular topic is that the issues associated with COTS look different to each participant in this process. And I love the parable of the blind man and the elephant, and it depends on what part of the elephant you stumble against as to what you conclude that you're working with. And at the jurisdiction level the elephant to us often feels like it's about managing the small, ongoing details that never seem to end with limited or non-existent resources to do testing and regression testing of those component changes back into the system. From the vendors, it's managing the complexity of testing, trying to position the product, so it moves quickly through testing, produces favorable results and can be moved onto the

customer with a high degree of certainty that it's going to work and work properly. From the testing community, to us it often looks like a problem of managing growing complexity, keeping the pieces scrapped into a pile, envisioning tests that don't exist, but yet have to be developed, the tests themselves validated and then applied. So a large part of what we've done in this first part of the workshops is to stake out those interests, stake out those positions. That's helpful to the EAC and I think it's helpful for the participants at the table to understand that this is -- it's a multifaceted problem and that ultimately the solution that the EAC hopes to refine and implement needs to optimize all of those interests. And so, we really appreciate the time that's been spent in mapping out those concerns from the different parties that are at the table.

When we return from lunch, we're now going to try to scrape these into a pile, get them categorized, help the EAC identify priorities, help the EAC identify next steps that can be taken and then talk about potential products and deliverables that may come out of this process that can be mapped back into the VSTL management process. So, good work so far.

I think given the time that we're at this is an appropriate time to break for lunch. And when we come back, we still have a couple of questions that we've got to go through from the original handout. And we're going to be doing more with the presentation, I believe behind us.

So, with that, let's adjourn until 1:00. And when we reform, we'll get right back to it all right? Thank you.

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[The roundtable panel recessed at 11:54 a.m. and reconvened at 1:04 p.m.]

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DR. KING:

Well, if we're ready, we'll resume. Thank you everybody for returning. Is there anybody on the line? I don't hear anybody, so I assume that they've dropped off the call.

Before we went to lunch we were finishing up the questions on the homework. And I'd like to talk about what our goals are for this afternoon and how we would like to conclude this. And I'd like to kind of work backwards from the finish line to let everybody kind of be organizing their thoughts towards the conclusion of the day. What's always valuable to the EAC and to me is that we come away with a clear summary of what we've accomplished. And that's important because as we reflect back on the day, it's an opportunity for me to get an accurate reflection of the discussion and the points that were made, and particularly the points that individuals want the EAC to carry away from the conversation. We also want to identify next steps, and those next steps can be a variety of things. But what we always want to do is look forward how we can build on what we've started and what would be not only appropriate next steps, but perhaps prioritizing those steps so that we can figure out, if we don't have resources to do everything, we can do the most important things. We also want to come back and reflect on some existing definitions. We started this roundtable with a simple question, what is COTS, and we've now got an opportunity to go back and look at an existing definition of it and review. And then, we have a series of questions that we need to

accomplish that are still left in the handout. So that's kind of the reverse order. But I want to give you a sense that we're driving this towards some fairly concrete summarizing activities the most important which is, what are the next steps? What do we recommend the EAC consider? What do we recommend jurisdictions consider, VSTLs, voting system integrators, et cetera?

All right, so with that, I'd like to get back to our question list that we got through partially question number five yesterday. And I'll go back to those questions. And I do recognize that some of these issues we've addressed partially already, but I think it also helps us to come back and remind ourselves that this issue has been addressed and just a quick summary of it if that's what's appropriate.

So, let's look at question 5(d). Voting system manufacturers are required to disclose known anomalies that manifest themselves over the lifecycle of the voting system. Do COTS manufacturers reciprocate this level of transparency and disclosure? And I think one of the embedded issues in this question is that we have a clear high expectancy of voting system vendors to disclose anomalies. But the extent to which a voting system vendor may be using COTS products, that in part, then depends on the willingness of the third-party vendor to reciprocate that level. And for jurisdictions that purchase directly from third party COTS providers, it's -- I think it's a comparable issue. So, let's look at that question. Do COTS manufacturers reciprocate the level of disclosure that's required by the voting system vendors?

Ed, if I can start with you.

MR. SMITH:

Sure, Merle, thank you. The answer to your question is, varies.
The larger computer makers, the makers of very ubiquitous
products, no. The makers of LCDs, where, like I spoke of
yesterday, you select an LCD maker that handles a mid-market
client base, a medical device, an aerospace market base with long
life cycles and high criticality applications, they will tend to.

DR KING:

Okay. And I think that's what you mentioned yesterday, is, working
with that kind of middle tier of providers that are so large that they
aren't willing to work closely with the relatively small number of
manufacturers in kind of the restricted customer base in voting
systems.

Okay, McDermott?

MR. COUTTS:

I echo what Ed said as far as the hardware is concerned. As far as
software, generally those software has discussion groups, users
groups, things of that nature where a significant issue will come to
light very quickly and have a very quick resolution, especially in the
open source community, that's one of the joys of open source, so
from that perspective, yes. And again, the mid market providers
also are very good about saying, "We have a problem and this is
how we're going to fix it." Generally, they won't announce a
problem until they have a resolution for it, which is not necessarily
the case -- well we have -- we won't announce a problem until we
have a resolution for it, generally, but being able to implement that
resolution is the challenge.

DR. KING:

Okay. What about from the jurisdiction perspective?

MR. TORRES:

You know, voting system manufacturers, I believe, they're scrutinized a lot more than the COTS because you've got organizations like Black Box Voting that are out there scrutinizing, League of Women Voters. So they're faced with a lot more legal challenges to the voting systems versus the COTS.

DR. KING:

Okay.

MR. STENBJORN:

I echo pretty much what we said. The voting system manufacturers tend to be more apt to disclose known issues. With the COTS products that we purchase that are ancillary to the voting systems there is no mechanism for communication. I mean, we buy Dell systems and Dell may or may not communicate to a relatively small jurisdiction as to whether or not it has known system problems. Or Okidata printers, they certainly -- we certainly don't receive technical bulletins that are meaningful to our election system. So, no.

DR. KING:

Yes?

MR. COUTTS:

To specify, are you talking about the third party COT contacting you directly or publishing the information out there where it can be found if you're looking for it? Which that's a very different thing.

An issue may be published, but unless you know to go and look for it you won't find it.

DR. KING:

Yeah, I think you're correct. And I know we monitor the Microsoft Websites where they post issues relating to their operating systems. But, to me, it appears to be more the exception than the rule. But your point is well made, is that it's probably unrealistic for jurisdictions to expect vendors to even know that we're using their products, much less have a method for contacting.

But, perhaps one important thing -- and over lunch I certainly reflected on the suggestion about the use of Wiki tools, that that kind of shared information about anomalies that occur with products that we know are widely used within the election community, COTS products, that could be another utilization of such a tool for jurisdictions to share information about products that develop problems once they're deployed in the field that are coming via COTS channels, okay?

5(e). If the lifecycle of a COTS component is significantly shorter than that of the voting system that contains it, are there strategies for mitigating this difference? And I think I'd like to start with the jurisdictions first, because we're typically the first to see some of these issues, and if you can provide examples or strategies of how your organization attempts to mitigate these difference in lifecycles.

MR. STENBJORN:

By spares. Realistically, I mean, we anticipate the fact that there are actual product lifecycle differences between our systems as

delivered. Mitigation strategies, you know, they vary depending on what the equipment is. I'm thinking about, specifically, the software libraries that are required for our Unity system that we just need to maintain them. So, we need to maintain a legacy build that is going to always run that version, that flavor of Windows that are certified for that software stack.

When it comes to other -- the peripheral equipment, again, we're at the mercy of the vendors, because there are going to be COTS components to each one of those systems that we're not familiar with or that we couldn't change out because it would invalidate the warranty.

So you know those issues -- those areas where we can control -- I mean, something actually -- a specific example popped to mind. We, in the District, for central tabulation use the ES&S M650 central tabulator, which is a fairly old high-speed scanner. Its software and its data storage are Zip drives, and they are Zip drives of a certain generation. And so, it's a classical example of technology, certainly, outpacing the component that we had installed. So that when we had to go out and purchase new Zip drives, it's new Zip discs, we purchased something that seemed to meet the manufacturer's specification. It's a COTS item. Obviously, it did not, since it erased the firmware when we loaded it. And so, then we had to have the vendor come -- yeah, it was just horrible. And so, we had the vendor come back in and reprogram the M650 and realized that there were very specific specifications for Zip discs that aren't manufactured anymore. But we were able to find some, and so, we purchased a larger supply

than we would ordinarily, to have them on hand, so that we could account for the fact that this was a legacy system that would need to be maintained for the foreseeable future.

DR. KING:

Did you get any pushback from procurement on -- specific pushback from procurement on warehousing or maintaining an unusual inventory of an IT product?

MR. STENBJORN:

In this specific instance no, but in the instance of our actual -- as I mentioned earlier with the PCMCIA cards that we tried to purchase, we were essentially told, "No, you can't order that additional supply of them," just because of the cost per item. With Zip discs, I think perhaps the difference -- the perceived difference was -- well, actually it was -- there was a legal procurement difference. One was the PCMCIA cards where we attempted to purchase them as part of our vendor contract and it would have then caused that vendor contract to exceed its limit for the year. While, with the Zip discs we were actually able to buy them from an additional supplier with which we didn't have an annual [inaudible] . So, I mean, it's really just a procurement issue.

DR. KING:

Luis.

MR. TORRES:

He had exactly one of the samples, an M650, which uses a Zip drive. Actually, the Zip discs are hard to find but, actually, the readers are hard to fine, too.

MR. STENBJORN:

Yes.

MR. TORRES:

And so, you have to really take stuff in your own hands to make it work. But you run across situations like he ran across where that didn't actually -- he went out, purchased the Zip drive thinking it's the same type and wipe out his firmware. So those are risks. And I think when we talk about COTS products, we're talking about the risk factor involved in it and spelling out those details.

DR. KING:

Okay. From the voting system manufacturers?

MR. SMITH:

Well, we get, you know, we try to develop new parts and things to overcome this sort of a situation. But here's the issue, and I'll put myself in ES&S's shoes for a moment, because whether ES&S with a 650, or a Sequoia with a 400C,anybody with non-COTS high-speed scanners, there's not that many out there in the country. How many do you have, two?

MR. STENBJORN:

Two.

MR. STENBJORN:

Two?

MR. STENBJORN:

Yeah.

MR. TORRES:

Six.

MR. SMITH:

Riverside County has eight or nine. Santa Clara County has a number more. And you know, California as a absentee roles, lots of high speed scanning going on. I mean, there's just not that many across the entire country, there's no market, and they're old products that are being replaced, at least in our company, by COTS high-speed scanners.

MR. STENBJORN:

Um-hum.

MR. SMITH:

I use that -- I tread dangerously on saying that they're COTS high-speed scanners. But Wyle says that they are, so I'll say that they are, too. Maybe my project -- no my project manager left. He left the table. He was smart. He got out while the getting was good. And -- but you just -- you're stuck. There's a balance there. There's no -- probably ES&S cannot really generate a reason to go to USB, or a common USB external drive or something similar now, because it's just not worthwhile.

MR. COUTTS:

And then, it would need to be recertified anyway.

MR. SMITH:

Which would then need to be recertified, exactly.

MR. STENBJORN:

And they're certainly not going to recertify the M650. My comment was not meant to discourage ES&S, or the equipment, because the equipment works as it's expected. I mean, this is just -- the question is, what can be done to mitigate the pace at which these -- because, obviously, we're not going to purchase another high-

speed scanner in the next five to seven years, and yet, we need to maintain this legacy system with this legacy COTS product.

MR. SMITH:

Um-hum, sure, so we end up doing some of the same things you're doing and what you speak of, in that, if it's a component we know we're going to need, we try and forecast a need and we stockpile that product while it's still in life or, in some sense of the word, available. But once again, inventory equals cash, cash is king and you're tying up cash unnecessarily.

DR. KING:

McDermott.

MR. COUTTS:

Not a whole lot to say on that. Obviously, with media, you have to be very careful because the half life of a media standard is getting smaller and smaller every single day, I mean, the transition from CDs to DVDs to, now, Blu-ray, you know. We'll be all streaming before we even know it, in which case, when there's no media left what are we going to do, at least in voting? I mean, that's one of those trends we need to watch. If there's no media left and we're requiring media, what do we wind up doing about that?

Again, the mitigation of this again stockpiling, buying a certain number. Again but, you know, your inventory is cash and it's cash that you are committing at a certain point and it becomes worthless after a certain -- at a different point. Having -- making sure that you design in clear upgrade paths is probably one of the best options that's available as far as that's concerned and making it -- and making those upgrade paths accessible and affordable.

DR. KING:

I'll share an experience that we had in our center in Georgia. And it really ties together, Paul, I think something that you emphasized throughout this workshop, which is the criticality of testing at the jurisdiction level. We -- when we are in receipt of a product that gets folded into the voting system, we have a process by which we attempt to identify the lifecycle of components within that product. And obviously, with servers it's things like disc drives, grade arrays, motherboards. And we made the decision with a specific Dell server that we would acquire an inventory of motherboards, realizing that eventually those motherboards will be gone and not able to repair. The mistake we made is we didn't test the motherboards when we received them. And when we got ready to deploy them four to five years after purchasing, they were out of warranty. And it wasn't even an issue that we could buy more. They simply ceased to exist. So we modified our mitigation strategy that when we do stockpile product it's tested upon receipt. And in the case of certain consumables, like batteries, not only test it upon receipt, but then, also have their own maintenance cycle as they're waiting on the shelves to be used. And I think the takeaway for us was that the only thing that's worse than having to pay for inventory you'll never use, and then, throw it away, is to not realize and not plan for it as a part of your ongoing process.

And so, I think as we go forward with maintaining a legacy system and searching for, evaluating COTS products that we can acquire and substitute in, that's -- a part of the expectation of our technical staff is that they are monitoring their browsing, they're

looking for product and we order a lot of sample products that we bring in and test, just in case they're needed by a jurisdiction. The sad thing is I'm about to surplus SATA 50 hard drives, 80 gig hard drives that we'll never put into anything and nobody else will ever be able to use, but we had them there in case they were needed in our system.

So, to me, that's the low hanging fruit on the mitigation is be aware of it, identify it, have a process in place, make sure that process is intelligible so that other people understand why you're doing it. And I think I said yesterday that many of the IT practices that we implement in voting system maintenance are unintelligible to our colleagues and other industries. They simply don't understand why we do what we do. And I know when we talked to Dell they just kept saying, "Well, just buy new servers. Why are you trying to maintain these servers that will run Windows 2000 Service Pack 4?" And to them, it seemed like a plausible explanation.

Okay, let's move onto question number six. And this, I think, is the tip of the iceberg question, because it is -- for jurisdictions that purchased during the HAVA rollout, this set of issues, has kind of overtaken almost every discussion that I get engaged with at the jurisdiction level, and that's the maintainability and sustainability of systems.

Part (a) says, "A voting system, typically, has a lifecycle of between eight to15 years." Maybe, that's arguable, but I think from just a jurisdiction point of view, we hope that it will last eight, and we're lucky if we can get beyond eight out of it. How does COTS

impact this lifecycle? How are these systems, including their COTS components, maintained? And is this a reasonable lifecycle from an end users' standpoint? What approaches have been seen for certifying these systems that involve COTS components?

So, looking here at how COTS is either extending or shortening or complicating the lifecycles of voting systems. And kind of a separate, but I think related question is, what are realistic expectations on the part of jurisdictions about the lifespan of a voting system? And from the vendors' perspective, what are you seeing from jurisdictions both in their RFPs that they're asking you to bid on, but also in the advice that you are providing to jurisdictions?

So, let's start with the lifecycle piece, first, which is, is there a reasonable lifecycle to expect from a voting system from the end user? And I'm going to start with Luis.

MR. TORRES:

I'll tell you, right now we're faced with that challenge. We purchased our new system in 2008 and now we're faced with a dilemma. Our vendor is upgrading their suite, their software package and they're getting rid of legacy products. And one of those legacy products we just purchased in 2008, and probably ran three election cycles. How can we justify, you know, going to our board and asking them, I mean, four years later that we need -- or two years later -- three years later that we need another piece of machinery? And we're faced with that. My boss is -- if this question was posed to him, he would probably raise some eyebrows because he's not really happy about that…

DR. KING:

Um-hum.

MR. TORRES:

…because it looks bad on him because he has to go in front of the board. But the reality is there.

But we also have to keep in mind that we also have legislation that takes machineries out of play, too.
And in 2006 we had touch screens banned from the State of Florida as a primary voting mechanism, in the State of Florida. So, you know, I have 150 units sitting on -- in our shop that never touched an election cycle because of that legislative rule and law that was passed. So, yes, it's hard.

DR. KING:

Okay.

MR. TORRES:

And it's hard to predict what the lifecycle is. But we are seeing changes happening more frequently where we came from an optical scan system that was purchased in 1990 and we got rid of it in 2006. That was 16 years. And we were self-sufficient, we weren't vendor dependent. We maintained the system our self. Now it's a different ballgame.

DR. KING:

Do you think that -- the lifespan of that initial optical scan system at 16 years, do you think that is luck? Do you think it was good system design? Is it something that has established a precedent within your jurisdiction that subsequent systems will be compared to in terms of lifespan?

MR. TORRES:

I don't think you can ever compare a system like that. I don't think you'll ever see a system like that. The durability of that system was just -- it was just durable. With the newer products, if they're broken you just replace them. Where, that product you were able to fix components on that particular product. Nowadays, it's just -- it's all the internal parts are consumables; memory modules and stuff like that. You just toss them and get a new one. So, I don't think we'll ever see those days where I can drop a machine off of a truck, plug it in and run ballots through and still count ballots.

DR. KING:

Okay. Paul.

MR. STENBJORN:

An experience very similar to Luis. While D.C. went through its procurement cycle last year in 20 -- the beginning part of 2010 to adapt to changes in the legislation in the District which required certain features like having the verifiable paper audit trail on the DREs, and also do -- and also early voting that required some changes in configuration. So there was a system that had been in place for I think eight to ten years that was heavily vendor influenced as well. It was entirely maintained by the vendor. And it had mixed successes, but it was incompatible with the new legislation change. Which, reflecting back on my experience in Virginia, really seemed determine choice more so than the rapidity of change within systems, especially over the last ten years. Now, you know, looking forward I can't imagine that the legislative

environment is going to be quite as dynamic in the next ten years as it has been in the last ten years.

But the expectation, and I think I mentioned this yesterday, is that in jurisdictions that this -- voting systems are not computer systems. In the eyes of local jurisdictions they're voting machines. And so, the structure of localities and local jurisdiction maintenance is still on the systems that they maintained for 50 years, 30 years prior.

I mean, when I was in Virginia, the City of Richmond, until its HAVA implemented system, continued using lever machines until 2005. And then, they chose to go with a system that was a touch screen system that was then, subsequently the next year, made invalid by State law. Now -- so again -- so the drivers aren't necessarily the evolution of the COTS components. It certainly makes it more difficult for us in D.C. right now to predict where we're going to be five years from now, because I can't envision the ENS -- ES&S suite that we have now still being viable in five years, partially because of the COTS. I mean, you know, right now we're already having issues with purchasing media for the machines and finding CF cards that are compatible. Floppy discs are a classic example. So, you know, five years from now I can't envision our being able to support this system. But we just purchased it last year. And would that be different if it were not so COTS intensive? Perhaps, but then, it would be a very different type of voting system with a very different price point.

So, it's kind of -- this is kind of the environment in which we are. And the question is how do we respond and -- how do we

respond to this? It's not so much what -- I mean, I really can't even factor what a lifecycle would be on systems until we start looking at these as computer systems with a reasonable five to six year refresh schedule. But that's not the current model, and it's certainly not the funding model.

DR. KING:

Okay, thank you. From the vendors, and Pete, in the arenas that you're involved in, I'm going to start with the vendors and ask that question about lifecycle, lifespan of voting systems, vis-a-vis, customer expectations.

MR. SMITH:

Well, customer expectation is the ten or 12 year, or more, lifecycle. There's even an implication in VVSG surrounding a ten-year design life. So, you know, you've got alignment there.

You know there are systems that are out there that are older than that, by far, the Sequoia Advantage being an example. One of the reasons it's been able to survive so long is because it had so much minimal use of COTS. The results cartridge, for instance, is a proprietary results cartridge. A lot of the technology -- it's a DRE, but it actually has push button switches. It's not a touch screen device. When it went through a recertification, at that time, under NASED, to allow the addition of audio to the device, that allowed for the addition of a more modern motherboard, the use of compact flashcards, at least for the audio, if not for the whole election definition, some things like that that helped it to continue into service, because some of these have been out since the '80s. And the Advantage was, at one point in time, fairly ubiquitous

throughout the country. Now, it's primarily in about three different States. But they're still using it. And there's been firmware upgrades. There's been the audio upgrade along the way. And that's what's allowed that product to stay in play. But I submit that underlying and germane to this discussion is that it doesn't have a lot of COTS in the machine at the subassembly level, such as the results media.

DR. KING:

And you think that's contributed to its long life?

MR. COUTTS:

Um-hum.

MR. SMITH:

Yes.

DR. KING:

Interesting. Okay, McDermott.

MR. COUTTS:

If I can, at the risk of being a little redundant, go back to the car analogy on this. When I was growing up, I could work on my own car. I could -- you know if I had an older car, I could get in there. I knew -- I could tell what was wrong with it. These days you need specialized equipment and training in order to know what it is. So I have to kind of submit that, you know, these aren't machines anymore. These are precision pieces of electronic equipment and need to be treated as such. Now, granted, cars still last for ten years so -- or better so -- but they do tend to...

MR. STENBJORN:

Some of them.

MR. COUTTS:

Some of them are meant to be replaced. Honestly, there's the classic case of the Yugo which was meant to be a disposable car.

So, I guess the question has to come -- the expectation in the VVSG says that we need to design for a ten-year life, which we have attempted to do, and hopefully, have succeeded. We'll find out in ten years. The -- but how quickly do you recycle IT? I mean, when you're dealing with your internal staff or at your department, how quickly do you cycle through? Is it every five? Is it every three? How often do you buy a new laptop for your house? How often do you buy a new phone? And do you have -- is everybody always the same? Or are you having a mix and match of -- and again, I realize that I'm kind of harping on this, but this is where the common data format comes into play in that that will allow you to have a mix of systems within a jurisdiction. This is what will allow you to say, "I understand that there is a cycle and I understand that we are going to be doing things -- that things are going to have to turnover and we're going to have to plan for it. Our budget is going to be like IT where we're going to spend not as much upfront, but we're going to cycle everything through over a course of "X" period of time." And I'll tell you that one of the best things that we could do with that is make sure the voting equipment has a life beyond being a voting machine. Can it be used in a library? Can it be used in a school? Can it be used somewhere else? Can we repurpose this equipment? I think that we have to get away from the machine. It's not a machine. It's precision equipment.

DR. KING:

Pete, any lessons learned about lifespan of systems and customer expectations out of your work with the Navy or prior work?

MR. MARTI:

Most of it has been in the computer industry and the normal lifecycle of five years. But the duty cycle is quite a bit different than what you experience in this market to where there's no reason why you can't extend it to ten years. But a normal – like you said a home computer, whatever, a home computer normally you're going to have to upgrade in five years. Why? Well, usually the software is not going to be supported. What you have on it at the end of the five years has already been replaced and that supplier, like Microsoft, is no longer going to support that. Well, from a home point of view, you've got to get rid of it, if you're going to use it for home or whatever. The same way with most of the duty cycles in the military, 24/7. The duty cycles are much heavier on components, peripherals, everything. They're considered, once you get them you turn them on and they're [inaudible]. The typical turnaround is roughly five years, a five-year span it's scheduled to be replaced. And this is mostly computers. Other than that, I haven't been involved with anything other than related to, you know, other types of systems. Of course you've got -- if you look at the war-faring systems like a radar, et cetera, ships typically 20 to 30 years. But within them they will upgrade their radars depending on capability, and those things. But it's normally -- duty cycle is quite a bit different than what you experience here. So the expectations are a little different. 24/7 is a lot different than, you

know, a couple days of the year when they're -- all at once it's got to be there and different -- I think it's a different ballgame.

To expect it to live ten years, I would expect your equipment to, just based on normal duty cycle. Life of a disc drive, how long does a disc drive last, you know, and the components that are normally used. A printer, those printers and simple things like that, every two years, every two years, something like a printer, they're upgraded to something else, the manufacturers. It all depends on what [inaudible] but most computers – I would say five years is a good time to say, "Okay, it's time to replace this system." But it's all based on duty cycle.

DR. KING:

Okay, thank you. Brian.

MR. HANCOCK:

I'm okay.

DR. KING:

Okay. Glenn, are you back on the line?

MR. NEWKIRK:

I am back on the line.

DR. KING:

Welcome back.

MR. NEWKIRK:

Well thanks. It's been an interesting conversation.

DR. KING:

I'm not sure when you came back in, but we've been talking about the issue related to expectations of jurisdictions about the lifespan of a voting system combined with kind of a shifting legislative

environment that has mandated systems be replaced well before they're at end-of-life, impact of COTS on that lifespan, that perhaps systems that exclude COTS may be more sustainable over the long haul because they're more stable, their component life is more stable, but also recognition that this is IT and IT has a fairly well established timeline for different products within it, peripherals as well as CPUs and related devices.

Do you have any reflections on that Glenn, in terms of jurisdictions' expectations versus the reality of those systems?

MR. NEWKIRK:

Well, I've been here pretty much since the beginning of the conversation Merle, and I guess I would, you know, reiterate and support the comments from Paul and Luis about what the original expectations were. To view it anymore as a voting system gives people -- or as voting equipment gives people the impression that these devices will last 15 years. And I think Paul's comments are very much to the point in that for many of them you really will be lucky to get eight, on what was listed on the topics of discussion here.

And I guess I would -- this kind of bleeds over into the next topic as well, but I guess I would say that it seems to me that the use of COTS, the increasing use of COTS and fluctuations in the COTS supplier market, as well, both from the point of view of people dropping out of it and other people coming in with newer, better mousetraps is probably going to shoot up another component of this and that is the cost of testing. If there is insistence, as there is in a number of States, that you do pretty

much end-to-end testing for what is considered a new system, well if you really do have COTS built into that new system, a change in one part of that system, in effect, gives it the definition of being a new system. You -- you know, we don't really have quite the same – I don't know, I would be interested in hearing your thoughts on this Merle -- we don't really have quite the same notion of regression testing in the voting system fields that are out there in a lot of other fields.

An example I would use would be like an Oracle or an SAT in the enterprise resource planning market. If you buy the entire Oracle suite, you will keep it for, whatever, ten, 12, 15 years, maybe forever, who knows whatever it's going to be, it will be an Oracle system. But within three or four years, you will upgrade it significantly and both Oracle and you will have done a very significant amount of regression testing every time there is an upgrade.

And so, it seems to me that accepting what Paul was talking about of viewing this as more and more of an IT system rather than a voting equipment operation is probably going to lead more and more people to get into that approach of doing repeated, frequent regression testing. I'd be interested in getting your thoughts on that Merle, as well.

DR. KING:

Well, I agree with you that the rigor and the depth and the scope of testing is a challenge at the State and jurisdiction level. And a part of that is operational. It's the timelines that are often very, very short for it. But it's also complicated by the effort that's required not

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only to administer the test but to develop the protocols for the test. And so, often when a new product, and I'll use barcode scanners. Barcode scanners were added to the Georgia voting system as a method of accelerating voter lookup in the ExpressPoll…

MR. NEWKIRK:

Right.

DR. KING:

…e-poll books. There are protocols for testing barcode scanners, but there is no protocol for testing barcode scanners integrated into a voting system. And so, it's not only developing the protocols, validating the protocols, and then implementing them and then backing out to a full regression test of the voting system, it is -- it's very complicated. And it is a daunting task, even for States that I think have -- comparable to Florida that have a testing division, because you're looking at the application of new products to new services for which there is no precedent.

But having said that, the requirement, operationally, is also complicated sometimes by just the nuance of what happens if this product fails the test. And so, I think a part of what goes through a State certification tester's mind is, "As I put together this protocol, as I look at how I'm going to integrate the testing, what are the possible outcomes and the implications of those outcomes?"

MR. NEWKIRK:

Right.

DR. KING:

And that just further complicates the issue.

So I would agree with you that the testing at the State level is -- it's different in tone, it's different in speed, it's different, in terms of resource, it's different in terms of vendor participation. And it's all overlaid with the specifics of the legislation, the rules and the regulations of that jurisdiction. And it's usually done with smaller staffs of people than VSTLs.

MR. NEWKIRK:

Right.

DR. NEWKIRK:

Okay, let's look at part (b) of question number six. What level of testing and certification is reasonable to provide the proper level of assurance of COTS components and their interaction with the system while keeping the cost savings that COTS is designed to offer? And really that's something I think Glenn was just touching on, which is when we have a doctrine of end-to-end testing should that doctrine be applied as new COTS products or identified for integration into that system.

Glenn, I'll start with you on that question, if you have thoughts on it.

MR. NEWKIRK:

Well, boy, this is one of the toughest ones because -- and I know you're in this position, as well. As a tester, you almost have an inherent built-in conflict of interest here. On the one hand you want to say, "Boy, the changes really don't appear to be such that they would warrant full end-to-end testing on everything because you're making changes in "a" COTS component or a few COTS components and this, that and the other, so it really doesn't warrant

end-to-end testing because you'd like to save money. " That's for your client. On the other hand, you sit there and look at it and you say, "Boy, if they come in and make one little thing here, and I only test this one little component of it and ultimately, you know, you pull the string on the cheap suit and the left pocket falls off on Election Day, then they're going to come back and say, "Why didn't you catch that in testing?" It's a very, very difficult balancing act.

And I think it's going to get even more difficult as States and local jurisdictions confront the budget realities that are coming down the pipe. I think there will be tremendous pressure to, I don't want to say short circuit, but to draw back on the level of testing that will actually be given to a lot of the new pieces of equipment as they come in and the new software as it comes in.

I mean, the answer to the question, you know, level of testing and certification is reasonable to a proper level of assurance. Once again, that's a function of risk and cost. That proper level is a tough one to maintain. It's just a very difficult balancing act. And that, I believe -- frankly, almost no matter what we say here, I believe that at the jurisdiction level, at the State and local level that will be answered in almost every instance with an ad hoc answer, both across jurisdictions and within an individual jurisdiction.

DR. KING:

Okay, Brian.

MR. HANCOCK:

Thank you, Merle. This is a perfect opportunity for me to give a shameless plug to our next roundtable discussion that we have

planned for the spring. And it will revolve around this very issue of voting system lifecycle, the maintainability and sustainability of voting systems out there, given the rather conservative fiscal environment that we're currently in. We've been working with a group -- subgroup of some of our Boards and The Election Center's JEOLC committee to talk about this. We've been sort of throwing around some definitions and decided that this would be a perfect topic for a roundtable discussion. A lot of these issues need to be gotten into in more depth, and we're planning, hopefully, in April sometime to have this roundtable. Certainly, the public and everyone else will get notice when we have some more solid dates for this. But stay tuned, more to come.

DR. KING:

Okay, shameless, but well done. What about from the jurisdictions, level of testing that -- and I know how difficult it is to describe level of testing. But give us some sense into the levels of assurance that would permit you to sleep well at night, the night before the election, after you've just integrated a COTS component into your voting system, if you can sleep well at night before the election.

MR. STENBJORN:

Sleep around elections?

MR. TORRES:

I think the situation with Orange County, anytime anything's implemented or brought to the surface we test from beginning to end. We don't take shortcuts. And it does make our testing process lengthy. But at the county level, we can provide documentation of every piece of machinery that we go through.

And whatever we do on Election Day is reciprocated throughout that testing process. And I think that's where some jurisdictions that don't have the capability, the IT staff to do those tasks and functions, hurt themselves, because they find out issues on Election Day, where we're fixing those problems and issues prior to Election Day.

MR. STENBJORN:

First of all, I need to agree with what Luis said, in, we don't sleep before elections. This is -- actually, what I wanted to touch upon, briefly, is a topic that something you just said Luis, and something you mentioned yesterday, Ed.

What D.C. does and what Orange County Florida does is not the norm for counties across the country, as you know Merle. Many offices operate with -- we, in Virginia, we had some registrars that were part-time employees, or there was a role that was part-time as a registrar, and there would be absolutely no facility within the jurisdiction to be able to conduct any type of reasonable technological testing of their equipment. And they didn't. There was never an expectation that they would, and so, they would rely on their vendor to do that.

So, when you think about what level of testing and certification is reasonable to provide, the critical word in that clause right there is actually "provide." And the question is, who provides this? Is this something that is going to be an onus on the vendor community to continue to come up with new testing mechanisms? And I think we've discussed this, and I'd love to document this better, is the idea of having some matrix of authority and

responsibility given to the vendors for testing new components. Because, while we in D.C. go through both a mock election and L&A test with each election cycle, because there are new components entered always, introduced in every election cycle, I don't -- there's no formality to that. There is no -- even though we do it well, or I think we do it well, we increasingly do it well, we don't follow a protocol. There's no enforceability on what we do. There is no contractual obligation that we're upholding.

So some of the methods that I might want to consider is building it into a standardized contract with vendors the idea of testing and certification because I think that type of agreement, a reciprocal agreement between the jurisdictions and the States and the vendors could really have some teeth to it, in ways that the EAC's oversight may be more advisory. That would be -- again, though, I'm glad to hear Brian, that there will be other discussion on this because there is so many -- every thought I'm having I'm peeling back another layer and there's 1,000 more thoughts that sit underneath that.

So I think it's a great topic for discussion to come up with a new testing certification regime that can leverage what COTS offers I think if it's predicated on all the stuff we've just been talking about is, you know, having jurisdictions perceive this as a voting system and not voting equipment, and maybe that will help the discussion move forward. I don't know how we do that.

DR. KING:

Okay. All right other comments on this question? All right, let's look at number (c). What approach do you suggest for maintaining

a static certification in an ever-developing, ever-changing COTS environment? And Ed, did you want to begin?

MR. SMITH:

Thank you, Merle. Let me reiterate what I talked about yesterday with the proposal towards, you know, addendum certifications, additional, you know, underlying or overlaying certifications to the baseline that receive full testing that, you know, if we can get to the point where the EAC promulgates some requirements, some rules of the table we've talked about and we've hovered around, regardless of how you'd cut up the table and classify it, and then go forward with some lesser test program add-ons to that to allow the technology to evolve. And if you're simply adding on newer servers and laptops to Brian's idea from yesterday afternoon, you know, if it's within a series and if it's cut this fine, you just scoot it forward. If on the other hand you are changing a motherboard in the voting machine, that gets further testing, maybe far further depending on what you're doing. Contact image sensor changes in an optical scanner you're right at the heart of the device. So, you know, extensive testing, maybe full testing relative to what that unit -- that optical scanner would go through as part of a new certified system, maybe all the way up to that point or just shy of it. But have the rules in place and be able to add on to the baselines.

Interestingly enough, at Overseas Vote Foundation last Wednesday, and granted it was folks who haven't ever attempted to certify a voting system before in their lives, they postulated that it was not possible in their world to have a certified system because of the threats to security of Internet voting systems constantly

evolving. They didn't see how you could work a static certification

program based on the threat models to Internet voting systems.

Now they didn't ask me and none of them had ever tried to certify a

system in their lives, as I mentioned, but it was their scratch-the-

surface thought about that situation. I don't agree with them, but I

can see how the lay person would come to that conclusion not

having thought it through as we have.

DR. KING:

Um-hum, okay.

MR. COUTTS:

It, primarily, becomes a case of configuration management and

establishing configurations within a certification that are accepted.

And again, the level of testing what is reasonable becomes a

function of what the context of the piece is. How important is it?

What do we have to touch in order to make sure that it works

throughout the entire system? But again, it really is configuration

management at that particular stage. You can install Windows or

you can install Office on almost any Windows PC up to a certain

point. But at some point it breaks and you have to be aware of

those breaking points.

DR. KING:

Okay. Well, I'd like to share one strategy that we're considering at

the State certification level which, of course, is different. And there

are products that are certified at the State level that exceed the

scope of the EAC certification program. For example, our

electronic poll books are State certified.

But one of the things that we've recognized and we've talked with vendors and convinced the vendors of is that the review process that precedes the certification has benefit to all parties. And from the State's perspective, it allows us to identify the functionality of the device, the supply chain, the management structure, the RMA procedures, the compatibility of the system when it's integrated into ours. And all of that review process generates usable data for decision making short of the risk of certification. And as I explain to vendors, there's considerable risk for failing certification; that it's not something that you want to do. If you engage in it, you want to go through and you want to prevail and you want to succeed. There's advantages to certification that if you sell a product that's been certified in one State, that can leverage you into other States.

So we've come back and taken a look at a tiered approach to State certification where the first tier is this extensive product review in which the outcome then positions the Secretary of State to make a decision of whether that product should be inside the envelope or not. If it's in the envelope, then it has to go through certification. But what we're seeing with some of the new innovative products that are being brought into the election arena is not obvious at first blush whether it should become a part of the system or not. So that's one way that we've been able to reduce costs.

The second is kind of pulling -- constricting the envelope of certification depending upon the product, for example, a signature verification system. One approach would be to require the vendor

to submit not only the application, the operating system, the build environment to configuration. But in this case we only ask them to submit the application, and we will provide the operating system and we will provide a range of servers to test it on, and then trying to pull up the certification envelop to get it up above what we consider to be the volatile components underneath.

So those are two strategies that we're using in the State of Georgia trying to not only reduce our cost of certification, but really to improve the environment for the counties that are administering the elections in getting product to them quicker, but also making it faster for vendors to be engaged and to move forward through the process.

I don't think there's anything there that's really that innovative, but I think it is important that we encourage States that have certification programs to look at the ways in which they're spending their dollars so that we can continue to maintain high-quality systems in the State and maintain the innovations that are coming up from creative vendors into that environment.

Glenn, do you have any reflection on the maintaining static certifications in the dynamic COTS environment?

MR. NEWKIRK:

No, nothing above and beyond what you've already said Merle. I think you -- the examples you've given and some of the previous comments have highlighted the problem.

DR. KING:

Okay. All right let's look at number seven, open source software and modified COTS.

Given the level of customizability for most open source programs is very extensive, should customizable programs or operating systems, such as Linux, be considered COTS? Since Linux is a component of your system McDermott, I'll ask that you start that question.

MR. COUTTS:

Well, the thing that's interesting about that is it becomes somewhat of a circular argument. If I am working with an open source product and I make changes to that open source project -- product where I am no longer using it as it was provided to me, then, I am bound by the license to submit my changes back into the cycle where it then becomes part of the product. So even though I made those changes, it's still technically COTS. So, you know, it comes back around in that way.

Luckily our need to actually do that has been non-existent. Generally we -- as long as the software packages are moving -- are functioning within the context that we have defined through our testing campaigns then we tend to leave them alone. Mostly what our level of customization has primarily been around configuration and removal rather than changing or additions. Mostly what we do is remove things we don't use or remove things that we don't want, primarily for security considerations. Or adding full-fledged packages such as intrusion detection so it's, you know, it becomes all of the piece. But again the discussion of open source that there is that sort of circular argument coming around as you made the changes, does it come back around and now become COTS again?

DR. KING:

Interesting. Do you have a sense the extent to which the open source community is reviewing your code as it's been modified for inclusion in the system?

MR. COUTTS:

Like I said, that actually hasn't come up. We haven't actually needed to modify a package that is working.

DR. KING:

I see.

MR. COUTTS:

And again, these come with very -- they have functions and we are using them for those functions and they continue to work. And again, they stay fairly static because we don't -- there's not -- we don't have to worry about the parts going out of warranty.

DR. KING:

Um-hum, okay.

MR. COUTTS:

So...

DR. KING:

Other perspectives on COTS? Pete?

MR. MARTI:

I'm unfamiliar with the -- basically you took software that you can customize?

MR. COUTTS:

Right, you can.

MR. MARTI:

You customize it. Is that exactly what you customized and changed

used in any other product anywhere? Is it sold to anybody else?

MR. COUTTS:

It's open source. So it's available on the Internet and…

MR. MARTI:

It's been made available, but it's not being used presently by

anybody else just how you modified it. It's not being used in any

other product?

MR. COUTTS:

It's being used everywhere. The Linux operating system we're

using, it's used worldwide. The user groups are loud and vocal and

very busy. And they're constantly being validated and checked. I

mean, not specifically through voting, but through a whole gamut of

uses and applications. So -- now all our configuration of it, the way

we've set up our users and permissions and that sort of thing, those

have changed. Those are different from whatever anybody is

using, but that is part of our build document. The VSTL and the

EAC are completely aware of everything that we have configured

and everything that we have changed as part of the system. Our

build document is 140 pages long.

DR. KING:

Earlier -- oh, Ed?

MR. SMITH:

And that's why I can build on what McDermott just said. I'm not

sure you can answer that question today for that reason that it is

customizable, but if you're customizing it within the bounds of what

the product, be it open source or not, allows you to customize or

remove, if you remove things, you know, arguably that's COTS, because you could purchase it or procure it and do the same thing I did. So, you know, once again, I don't think that's answerable today, because we have to get to a definition of COTS and we have to understand what the EAC wants to do in terms of testing.

But we use Linux in the tabulators and it's a different variety of Linux as you see Linux. You know we configure it, we remove the non-needed functions and Wylie builds the code.

DR. KING:

Do you see wider use of open source code in the future of your company's products?

MR. SMITH:

Yes.

DR. KING:

And could you speak briefly to the benefits of that and perhaps some of the risks that you've evaluated as a part of that decision?

MR. SMITH:

I sure can. One at the top of it is we're here to do what the customers want and there's greater market acceptance of open source operating systems. So we've moved the tabulators to open source and we're looking to move our election management system to open source in its next generation. So that is a kingpin benefit there, that it's what the customers want to see.

There are some perceived security advantages because you have the community development, you have different pairs of eyes reviewing the code, developing the code, all those things you read about from, you know, the open source folks.

Disadvantages are that it is constantly evolving, it's constantly changing, you know. If you and I go to different Best Buy stores to buy Windows 2008 R2, if you can even buy that in a store if we order it, we're probably going to get the same build number. Microsoft, you know, releases builds fairly infrequently and such, and we can have the same things running on our different machines which can help in, you know, a kind of a fabric deployment as we have with election systems in this country. Whereas with the Linux products, every few days there's a new build, new submittals out there, changes, updates, add-ons, all of those things.

So the benefits can also be a drawback to use open source. And this is -- it's not any different than anyone else and I think McDermott would agree. These advantages and disadvantages are in the literature everywhere surrounding use of open source products. And ours, even with the static certification environment laid on top of it, aren't really any different than anyone else's in terms of advantages, disadvantages to use of open source relative to other industries.

DR. KING:

Okay, thank you. Paul, did you have a comment?

MR. STENBJORN:

Actually a lot of what Ed just said. Just the common understanding of what open source operating systems are and that there really aren't inherent -- if one uses a standard release, even if you don't deploy the entirety of the release, it becomes fairly conventional operating system deployment, while it's -- while there are certainly

opportunities to customize it. If the vendors choose to deploy

something that is a commonly available flavor of Linux with a

current build revision and certain components of it, I don't see how

that should be treated differently than a Microsoft deployment, to be

quite honest. I mean there's really nothing intrinsic about open

source aside from the fact that in theory one could go into the

source code and make modifications to it. I mean, but there should

be some sort of a baseline certification that this is an official

released version. And then it should be treated -- in my estimation I

would feel very comfortable as it being treated as a COTS OS.

MR. SMITH:

That's why the VSTLs get it from the online sources…

MR. COUTTS:

They can configure it for you in the build document.

MR. SMITH:

...because there's -- because -- other than the circular situation

McDermott pointed out earlier, there's no opportunity for me to get

in and somehow fiddle with it.

MR. STENBJORN:

Yeah, precisely.

DR. KING:

Okay, any other comments on open source software modified

COTS?

MR. COUTTS:

Well just one brief comment regarding security as far as open

source is concerned. One of the benefits of the open source,

particularly around the Linux operating system is because each

configuration is different. Every time -- the way Ed's putting

together his Linux operating system it's not the way that I put mine

together, and vice versa, it makes it very difficult for these to be

accessible to any sort of viruses. Basically they're so different that

there's no commonality that people can lock onto and say, "Okay

this is how I'm going to attack this." They're all so different, and so

it gives it a certain level of security. It has its drawbacks as well...

MR. STENBJORN:

Yes, it does.

MR. COUTTS:

…but it kind of decreases the need for yet another piece of

equipment that you have to pay for as virus protection.

DR. KING:

Glenn do you have anything on this topic?

MR. NEWKIRK:

No, no I think both of the representatives from the vendors stated

pretty clearly the advantages and how it works. Whether we will

see more of it or not I think probably remains to be seen as we go

forward because it will, in many respects, will depend on what the

vendor community as they get together and really demonstrate the

advantages of it, if it turns out to have a lot of advantages.

It does -- I will say kind of reflecting on McDermott's last

comment it does -- that exact strength also creates some testing

challenges down the road because, again, presumably pretty much

if you get a flavor of a non-open system -- operating system in

there, you pretty much know what's under the hood. Whereas

when it comes in with the open system model you know it but,

again as you said, Ed's flavor can still be slightly different from your

flavor and so it does create some testing challenges. Nothing that,

you know, can't be overcome but they're still there.

DR. KING:

Okay. Paul did you have a comment?

MR. STENBJORN:

Are we going to touch upon (b) as a separate topic on this question

or have we kind of subsumed that?

DR. KING:

They're blended together right now.

MR. STENBJORN:

Then I would like to make one further comment, if I may…

DR. KING:

Sure.

MR. STENBJORN:

…on the risks associated with the use of components, open source

components specifically.

One of the risks that we experienced in D.C. about using

open source components in a voting environment was the rapid

changeability, which is something that Ed referred to, within the

components themselves. New releases -- I'm not talking about the

OS so much but other components that may be available for use;

that because of the rapid deployment of open source components

there are -- it really requires additional layers of testing of all

equipment of all systems because the very nature of open source

software development means oftentimes it leads to lack of

regression testing in each module as it's released. So it just -- it's a

very -- it's a quickly moving target. So there's just -- it's really just -- it's an essential component of open source deployment is to have a full regression test. Or, actually, I think what I hear McDermott talking about is working on static builds that are essentially -- that are not current builds necessarily.

MR. COUTTS:

Right.

MR. STENBJORN:

Is that what your model is?

MR. COUTTS:

Yeah, I'm glad you actually brought that up because when we certify we're certifying based on, again, a moment in time. And since the systems tend to stay unconnected and, in fact, one of the requirements for the builds is that we remove the update tools. The automated update tools are not part of the build because of the way the VVSG is put together. And so what we are doing is we're coming up with a -- we are -- from a security standpoint we are constantly monitoring the packages that we have installed and are periodically coming up with our update releases of saying, "This is something that should be updated," or not. And we're creating the update disc around that so that those can -- so that that disc can then be checked and verified through whatever process. And again this comes up to the concept of having a predefined test plan where I can take this disc and I can say, "VSTL, I am doing -- I have this. Can you please make sure that we didn't break anything by adding this," even though there's no critical system components on it.

DR. KING:

All right, I think the next thing that we're going to take a look at is the current definition of COTS as it exists within the VVSG. And I'm going to ask Brian if he would lead the discussion on not only this definition, but the kinds of input that might be useful in clarifying or expanding this definition.

MR. HANCOCK:

Thank you, Merle. The two definitions that you see before you on the screen, the first one as you see is from the version of the VVSG that we're currently using in testing, that's 2005. The definition on the bottom is the one that was put forward by the National Institute of Standards and Technology and the TGDC for the Next Iteration of the Voluntary Voting System Guidelines.

Current definition defines commercial-off-the-shelf as, "Commercially -- commercial readily hardware devices, such as card readers, printers or personal computers, or software products, such as operating systems, programming language compilers or database management systems."

The Next Iteration definition defines commercial-off-the-shelf as, "Software, firmware, device or component that is used in the United States by many people or organizations for many different applications and that is incorporated into a voting system with no manufacturer or application specific modification."

So that is currently where we are and where potentially we are headed. I guess what I would like to throw out for the group is your thoughts on this. Do either or both of those meet what we think is a good working definition for COTS? If not, what needs to be changed? And then perhaps I think Merle and I discussed

talking about potentially a definition for the MOTS that we
discussed yesterday, as well.

So let's just talk about those definitions up there right now.
And we'll start off with the 2005. What do you think, adequate,
inadequate or if so how? How is it inadequate or why is it
inadequate?

MR. COUTTS:

What are we trying to accomplish with this definition? Are we trying
to define a line between a level of testing with the definition? Or
what…

MR. HANCOCK:

The definition I think as it stands is simply trying to determine --
help determine what a COTS product is and not necessarily define
a level of testing.

MR. COUTTS:

Okay.

MR. HANCOCK:

Well, let me start since I haven't heard anything. I think commercial
-- we all would probably agree that commercial is okay at some
level. The "readily available" is where I potentially have some
issues. I mean, as we talked yesterday, does readily available
mean available at Best Buy?

MR. SMITH:

Right.

MR. HANCOCK:

Or as Ed said yesterday, are we talking more about industrial grade type of COTS? So maybe that "readily available" portion of the definition needs to be modified a bit.

MR. SMITH:

Okay, well -- and there's no -- unlike the Next Iteration definition, there's no specific prohibition against modifications.

MR. COUTTS:

Yes.

MR. SMITH:

Now I'm not sure I agree with the "application specific modification," I'd probably have a little heartburn over that, but I think that the definition we wind up with should have something that says "no manufacturer modification."

MR. HANCOCK:

Um-hum.

MR. MARTI:

Could you say "commercially available"?

MR. COUTTS:

Manufacturer or integrator?

MR. STENBJORN:

Yeah, because then you get into -- I mean then you would get into a definitional issue of who the manufacturer is. You're talking -- or manufacturer of record.

MR. SMITH:

But manufacturer…

MR. HANCOCK:

No modification by the voting system manufacturer.

MR. SMITH:

Yeah, because "manufacturer" is a defined term in the EAC

program. It's...

MR. STENBJORN:

Yeah, manufacturer of record.

MR. SMITH:

It's us.

DR. KING:

Pete you had a comment?

MR. SMITH:

Could you say, "Commercially available in the United States"?

MR. STENBJORN:

Well I don't think you want to say "commercially" because you talk

about open source which might not fit under the definition of

commercial.

MR. SMITH:

Yeah, because you're not doing commerce.

MR. STENBJORN:

Yes.

MR. SMITH:

So it's not commercial.

MR. MARTI:

Yeah, that's true.

MR. SMITH:

You're giving it away.

MR. MARTI:

There is a problem there with [inaudible] trying to define it.

MR. HANCOCK:

So are there some advantages? I think Ed started talking about the Next Iteration definition.

MR. SMITH:

I have some issues with the Next Iteration definition, I do. I understand some of the issues NIST and the TGDC at that time were trying to solve because I attended those meetings, but I think in some ways they were solutions looking for problems such as the "used by many people or organizations." If you delve into VVSG, there's even some numbers around that, you know. The software has to have 10,000 licenses…

MR. HANCOCK:

Yeah.

MR. SMITH:

...somewhere? James you have it up there, 10,000 licenses to be COTS?

MR. LONG:

Something like that.

MR. SMITH:

Something like that. And I kind of scratch my head, "Well where did that number come from?" There's no scientific basis for it. I suspect somebody thought, well, that's probably enough. So if it has 9,999 licensed users it's not COTS anymore. Huh?

So I took some issues with some of the details and specifics that underlie this definition that was developed in 2007. But I like the "that is used." I like that piece of it in addition to it being

available it is in fact used. I'm not sure that it matters so much that it's in the United States.

MR. HANCOCK:

I agree.

MR. SMITH:

It's a global economy. It gets a little bit more global every day. I'm not so sure that's necessary. "Different people or organizations," so they were looking to not have things deemed COTS that were specific to the voting systems industry. Okay, I'm not sure that that's necessary, but I can understand where that might be advantageous. So -- and that falls under the "for many different applications," and "that is incorporated into the voting system with no manufacturer or application specific modification." So if I go to Microsoft and say, "I need Windows to have some additional security characteristics that it currently does not have," and they vend that to me and they make the -- they put it in a product catalogue and it sells 10,000 licenses, why not? Why is that not COTS just because it has something that I ask for in this industry or to help out my system to run a little more securely and to meet customer requirements in this space? So I like -- the "no manufacturer" I have no issue with, but the "application specific" I think is a little too broad.

MR. HANCOCK:

Anybody else?

MR. COUTTS:

I actually agree with that because there are definitely situations where you will actually wind up improving a -- the product offering

through the course of your use and your testing. And then that becomes something that then gets -- you -- basically you've given back into that -- into the product and it becomes part of the normal release.

MR. HANCOCK:

So for the Next Iteration if we deleted "in the United States" and "or application specific," would that be better?

DR. KING:

It seems to me that the inclusion of the phrase "for many different applications" addresses that concern that it not be exclusive to voting…

MR. SMITH:

Yeah, who cares how many at that point?

MR. HANCOCK:

Yeah. Better?

MR. SMITH:

Although Cepstral Voices, Microsoft Voices.

MR. COUTT:

Um-hum.

MR. SMITH:

What do you use, one of those two probably? Because there's only a couple.

MR. COUTTS:

We actually don't synthesize.

MR. SMITH:

You don't synthesize, okay. So there's only really two that are robust packages of voices. What else do you use a voice package

for but synthesizing voices? So maybe that doesn't fit under "the many different applications." Different industries, sure. Other people who synthesize voice could utilize it.

MR. STENBJORN:

I think the word "applications" may be inappropriate because -- you're right because you're looking at a specific component that could be used for an application.

MR. COUTTS:

Context?

MR. SMITH:

Context or…

MR. STENBJORN:

Industry used.

MR. MARTI:

And another suggestion, not only for that, it is...

MR. SMITH:

It's an application. Okay, now we're closer.

MR. MARTI:

It is -- by many different people or organizations that's a variable. Do we really need this here in a statement? We know that's going to be used by other people. So to me it's just wordy. We don't -- it's not part of the definition. It…

MR. COUTTS:

Take out "people" and just do "organizations and industries."

MR. TORRES:

Exactly yeah, that's better.

MR. STENBJORN:

"Used by different organizations...

MR. MARTI:

Right, instead of saying "by many...

MR. TORRES:

Organizations and industries I think -- I agree with.

MR. STENBJORN:

Do we want to say something -- would you like to see something specifically stated for purposes other than the administration of voting systems? I think that's kind of critical. I mean, I think that kind of captures it all without saying "many different industries and organizations" or...

MR. MARTI:

Right it gets down to this is what the definition should be. You can always have nice words, but it means nothing, and especially in the definition.

MR. SMITH:

So no more "many different industries or organizations" but in use in...

MR. STENBJORN:

For context other than voting systems.

MR. SMITH:

And used outside of voting systems deployment?

MR. STENBJORN:

Um-hum.

MR. COUTTS:

Or election management.

MR. STENBJORN:

Election management. For use in applications…

MR. HANCOCK:

Currently in use outside the election industry?

MR. STENBJORN:

…outside the election industry? Yeah, outside the election industry.

MR. MARTI:

That makes more sense.

MR. STENBJORN:

It does.

MR. MARTI:

Yeah.

MR. SMITH:

You kill off having to define how many is many.

MR. STENBJORN:

Yeah, exactly.

MR. SMITH:

And having a bright line that says, "Oh, 10,000 but 9,999."

MR. COUTTS:

Difference between a cult and a religion, right?

MR. SMITH:

I think we're getting close now.

DR. KING:

Is there an advantage to not providing examples? The first definition gives examples. I think the problem is that become dated easily.

MR. STENBJORN:

Yes.

MR. HANCOCK:

Yeah, I don't think we're going to change the 2005 since we can't really do that currently but, you know I think that's a valid point. In moving forward, we probably want to stay away from that.

MR. SMITH:

Yes, you eliminate flexibility if you define too many terms in the definition.

MR. STENBJORN:

And there examples of things; "software, firmware, device and components."

MR. HANCOCK:

Um-hum.

MR. STENBJORN:

Those are generic enough terms that are probably going to be…

MR. HANCOCK:

Yeah, I think for this level, the COTS definition we want to keep it pretty high level, pretty generic.

MR. COUTTS:

So we're using the commonly accepted definition of software and firmware rather than the original one in the VVSG?

MR. HANCOCK:

I think we should probably keep it to the commonly acceptable definition, yeah.

MR. COUTTS:

Thank you.

DR. KING:

Are there commonly accepted definitions of "device" and "component"?

MR. SMITH:

"Component" I think is a defined term.

DR. KING:

I like the breadth that component provides. It lets -- things can be folded up underneath that.

MR. HANCOCK:

Glenn, are you able to see what we're doing on the screen here?

MR. NEWKIRK:

No actually I'm not really able to see it right now, but I'm following along with it.

MR. HANCOCK:

All right, well, I'll read for your benefit the definition -- the working definition now that we've sort of played with for the Next Iteration. And that now reads, "Software, firmware, device or component that is currently in use outside the elections industry and that is incorporated into the voting system with no manufacturer modifications."

MR. NEWKIRK:

Yeah, I guess the reason I like that one better than actually the 2005 version Brian is it comes a lot closer fitting with the definitions that are already out there in other documents like, as I mentioned I think yesterday, some of the NIST documents. So that -- I think those are good words to have with it.

MR. HANCOCK:

All right, thank you.

MR. KING:

I have a question…

MR. HANCOCK:

Sure.

DR. KING:

…now that we have a different definition, or description perhaps.
Does the word COTS, which has a predefined meaning outside of
voting systems, does COTS still describe this new animal? Is it --
in other words, when we talk about this, the Next Iteration definition,
will we continue to use the word COTS to describe it?

MR. HANCOCK:

You know, I mean, just to give TGDC and NIST their due, there
was some additional language here that we took out because it was
just informative that says, you know, we understand that sort of
COTS is moving beyond the traditional definition. But because it's
so commonly accepted in the voting industry and other industries,
we're still going to essentially use COTS for definitional purposes.

MR. NEWKIRK:

And Brian I think that would make a lot of sense because one thing
we have learned in the past two days, particularly with comments
from Pet and Bill is that these -- this discussion and these kinds of
problems are not unique to the voting systems industry. Everybody
has these kinds of problems and they're still using COTS. And
while there's a certain amount of people sitting around nodding
their heads and saying, "Yes, well everybody knows what we
mean," when in fact maybe not everybody does know that we
mean, but the reality of it is it's a term that has some common

frequency and common use. And as long as it allows you to get down to the operational definitions that we've been talking about, I think it makes a lot of sense.

DR. KING:

Okay thank you, Glenn. Pete, go ahead if you would and share your observation.

MR. MARTI:

In looking at the sentence, it's syntax. But I was looking at okay "manufacturer modifications." What does it apply to my voting system which is closer within, you know, in looking at the sentence. Or does it mean to the software, firmware, device or component? In other words, after the "and" how that links -- that whole second part links into the first part.

MR. COUTTS:

Oh, I see the fact that the "no manufacturer modifications" needs to link back into the top of the first four words. I think it should do that more clearly.

MR. STENBJORN:

Yes.

MR. COUTTS:

So "a software, firmware, device or component with no manufacturer modifications that is currently in use outside…

MR. MARTI:

That's right, that's what I was saying. It definitively points you to the "software, firmware and device," because otherwise it points you back to the…

MR. COUTTS:

Um-hum, right, and we clearly want to…

MR. STENBJORN:

And make sure -- I don't know what other clarity you can be provided to ensure that -- it's obvious that manufacturer refers to manufacturer of record.

MR. HANCOCK:

Actually James brought up -- we were talking -- brought up an interesting point talking about the one potential advantage that the use of the word "commercial" might buy us is, you know, if you were talking about software -- particularly software here, there's a lot of software floating around out there. And perhaps, you know, the term commercial would imply there's at least some warranty or someone to stand behind some large organization to stand behind the software. This would leave it a bit more open ended you know. I'm not sure if that's a real concern or not, but it's maybe worth exploring at least for a moment.

MR. COUTTS:

Well, you'd have to…

MR. MARTI:

The more inclusive…

MR. COUTTS:

You start having issues around some of the open source libraries because those do not have generally large companies standing behind them. But they are -- if they're part of the SourceForge project, or if they're part of the Apache project that lends them a certain level of validity and weight. Do we want to impose weight

and validity on the open source? That might make sense, but it's

not necessarily a commercial process.

MR. HANCOCK:

Um-hum, um-hum. Anybody else on that issue? Well, it's

something we can keep in the back of our mind.

DR. KING:

Yeah I think I hear a consensus on the intent of this Next Iteration

definition as it's currently edited. There may need to be

refinements to the syntax and possibly a way to address that what

"commercial" adds to the initial, whether that can be added.

MR. HANCOCK:

Right.

DR. KING:

But I think this is a definite improvement.

MR. HANCOCK:

Yeah, I agree. It's something we can work with moving forward,

great.

DR. KING:

Okay.

MR. HANCOCK:

Excellent.

DR. KING:

Thank you, James. Now's the time where we begin to gather

steam to head for the finish line. I'd like to start with kind of the

next steps piece to building on to what we've got started today and

where and how we can go forward.

One of the things that was mentioned earlier today that I'd like to throw out for further discussion is the notion of a Wiki. And what I think would be most beneficial in terms of level of detail to provide to the EAC on any suggestions that this roundtable makes to go forward is perhaps not to describe how the EAC should do it but to better identify what goals could be accomplished, what criteria they may choose to use to design and implement any recommendation that we make. That gives them the latitude, the necessary latitude to look at the operational decisions and it also keeps us from having to get bogged down into the level of detail that in an informal group like this we're probably not prepared to do.

So let's start with that notion of a Wiki and I can't remember if it was Paul or McDermott that brought it up.

MR. COUTTS:

It was me.

DR. KING:

It was McDermott. Have you had a chance to think anymore about that and how that might look?

MR. COUTTS:

Not from the EAC's standpoint. My primary focus has been how I would integrate a Wiki as part of a customer service module within my own company and, you know, and being able to do like Dell does…

DR. KING:

Um-hum.

MR. COUTT:

…with the tracking of the -- tracking of numbers and being able to pull up the exact history of the device, that sort of thing.

As far as from a national standpoint, off the cuff, some of the things that would be useful, the number one is what are the certified systems we have. Who's using them?

DR. KING:

Um-hum.

MR. COUTT:

What are -- and then what are their experiences? What are -- how is everything linked together? What issues have they come up with? Can we link to the test plan? Can we link to -- basically bringing it altogether into more of a matrix to say, "This is where everything is and this who's using it and this is what they've seen around this issue," and being able to track it. I mean one of the -- again it's very hard -- unless you know where to look, it's hard to find where people are publishing what the issues are.

And the last thing I want is somebody to be hiding in the shoot from me, which happens. I mean I know that people don't say everything that they really want to say. And we need that level of honesty.

DR. KING:

Um-hum. Okay so, certainly, one aspect of a Wiki could be as an extension of a CRM system.

From the jurisdictions' point of view if it's such a device were in existence, what would be your expectations for benefits to be derived from it?

MR. TORRES:

There is a system in place with our vendor. They call it the portal,

basically. But those -- the portal is hard to navigate. There's so

many documentations. I mean, when you have technical bulletins

flying past your desk, it's hard to keep track of them.. So it has to

be user friendly for one. But is will be a benefit because there is

counties that don't have the testing capability that we have that can

refer to one of those Wikis, user friendly Wikis and see that, you

know, one of the larger jurisdictions actually ran across this issue.

And we see that all the time. The only reason why some of the

smaller jurisdictions know now is by word of mouth, you know, not

by looking through technical bulletins.

DR. KING:

So certainly test documents and test results…

MR. TORRES:

Yes.

MR. COUTTS:

Test plans.

MR. TORRES:

Test plans.

MR. COUTTS:

Recommended test plans.

MR. TORRES:

And, you know, one of the things when the EAC came to our office

and I presented to them is I have test documents. I have checklists

that show the process that I test this equipment. And there are

counties that come to me and say, "Could I get a copy of that

checklist?" And they modify it to their organization. We transmit

results. They may not transmit the results, so they'll strip out that portion of that checklist. So…

DR. KING:

Okay, what else Paul?

MR. STENBJORN:

Well, you know, first of all having something that isn't vendor moderated would be really beneficial. The question really -- you know the usability or not usability of any type of online information sharing portal has to do with the type of information -- the data collected and what type of schema structure we put into place for that data capture. Knowing what information we're going to capture from whom and having some mechanism to provide that information in a relatively seamless way, because understanding most jurisdictions don't have technological capacity. So if we know what we're looking for and we can track those data and we come up with some reasonable, a normalized dataset that we can capture on a jurisdictional basis, I think that would be really helpful because then that can lead to something that was more searchable, more -- you know something that's more robust and will be scalable as well.

I think just coming up with a repository where people dump their test plans, although it could be helpful, I think that ends up being quickly becoming unusable unless there's some meta data there that really is more descriptive about that. Because that's really what ends up happening with the, you know, the current vendor portal is it's just this mass collection of technical bulletins that just is not terribly user friendly. And also I don't think it could be statistically analyzed in any relevant way because, again, you

have unstructured data. And so you need something more structured so it can be a more useful tool for EAC, for the vendors, for the jurisdictions to be able to test against.

DR. KING:

Okay. What about alternate suppliers, any experiences with finding other sources of material would that be a value to jurisdictions?

MR. STENBJORN:

Um-hum, yeah.

MR. TORRES:

Yes.

DR. KING:

Okay. One of the things -- of course L&A test plans are jurisdiction specific because of regulatory requirement. However, designing your own L&A test against a new product it is extremely helpful to see how other jurisdictions have skinned that cat.

MR. STENBJORN:

Um-hum.

DR. KING:

So being able to share L&A models would be a value to jurisdictions?

MR. TORRES:

We do. We do that right now in our present. We -- and I get calls throughout the whole State of, you know, how you guys test, what do you test. And we spell it out for them, hand them the documentation and all that. And some of them they use and some of they say, "Well this -- we're not going to do that. That's too much," you know. So, yes, it's shared right now. But it's -- again

it's word of mouth. "Who knows Luis from Orange County? He's got documents."

One of the things that we do, too, is we have a standard procedure on opening up the equipment. We learned that if there's photographs, our poll workers can do it better. So a lot of our documentation is picture oriented. So -- and they like that. And there's counties out there that know we have that document, so they ask us for that document. So it's all depending on the user groups because you're not going to get it from the portal. And, yes, it would be user friendly.

DR. KING:

Okay.

MR. COUTTS:

That brings up an interesting point around documentation because, again, every county is not going to use the system the same way.

MR. TORRES:

That's correct.

MR. COUTTS:

You have different rules, different things, straight ticket, no straight ticket, what have you. But things like being able to share pictures or being able to create a, you know, latex is a tool that is used to manage documents that basically allows you to configure a user's guide to whatever it is that you need it to do. You don't want that part? Well, you just check that off and you make it disappear. And then when you output the document after running it through the latex, it's basically a customized document of what you want. So

that's one of those tools that becomes very useful as far as a document management system.

DR. KING:

Is there any concern on the part of jurisdictions that because the information by the very nature of Wikis is anecdotal that's put forward that there would be issues of verification of the content of the Wiki? Or is it safe to assume that users understand now that Wikis have been in widespread use for quite a while that verification from two or more trusted sources is still probably a good idea regardless of what you read on a Wiki or the Internet in general? Is our user community sophisticated enough now that that would not be an issue?

MR. STENBJORN:

Those are two completely different questions.

[Laughter]

MR. STENBJORN:

Yes, Wikis are a well enough accepted now that, you know, with user feedback mechanisms on them that people could grade the relative strength of specific answers and be willing to go, "Show me the best answer to this question" and be able to do that. Are -- is our user groups sophisticated enough to use that?

MR. TORRES:

That is to be determined. Yes, that's a tough one.

DR. KING:

Is the value of the information worth the pain of that learning curve?

MR. STENBJORN:

Yes, yes, yes.

DR. KING:

Maybe that's the question.

MR. TORRES:

Yes.

MR. STENBJORN:

Yes.

DR. KING:

Any other comments on the idea of a Wiki? It's a good idea, I commend you for that.

All right another question that came out earlier, really one of the first things that was talked about yesterday was a variety of classification schemes. And there were -- there's a couple of different flavors that have been proffered; the FCC class one, class two, class three, the scheme that you mentioned this morning of three components added to a fourth. But without kind of getting down too deeply in the weeds about the schema of such a program, can we pull back up and talk about what the attributes -- or the benefits, I should say, of a classification program could be and then the details of that can be perhaps worked out to produce those benefits. But -- so I'd kind of like to pull that discussion back up to what benefits would be derived from having a classification schema for COTS?

MR. NEWKIRK:

Well I think one benefit right out of the shoot, Merle, would be it would provide at least the basis of a documentation infrastructure for what your operational definition of COTS is. I mean right out of

the shoot you'd have something like that. And I think that would be tremendously beneficial.

DR. KING:

Okay. So when you say an internal infrastructure Glenn, for the VSTL? For the EAC? Who are the beneficiaries of that?

MR. NEWKIRK:

Well I think it would be everybody, but in particular I believe the beneficiaries would be the State and local election jurisdictions because they're the ones where the actual change and replacement activity of a COTS component is likely to occur. I think, as I mentioned yesterday, you know, very frequently these questions are made on the fly, usually in September and October, if not the day before the election or the day of the election in November of, "Can I replace this? Can I replace that?" And Luis is right. I mean election officials will do what is necessary to get the election done. But it sure would be nice to have some notion whenever this -- whenever you're going through this, regardless of when it occurs during the election cycle, that if I replace this widget I don't even have to worry about testing. I don't have to worry about breaking anybody's accreditations rules. I don't have to worry about breaking anybody's warranty. This is a class one and I can simply move ahead with it. I think the beneficiaries would be almost across the board.

DR. KING:

And class one right now being just a stand-in identifier for a true COTS product?

MR. NEWKIRK:

Yes.

DR. KING:

Okay.

MR. TORRES:

 I second what he said.

DR. KING:

Okay.

MR. NEWKIRK:

And oh, if I could, one of the things I mean you ask here in 8(b) -- I guess it's really 8(a) and 8(b), if this is the appropriate time for it, but really to attempt to move forward and create that kind of a classification system and, you know, prototype it and see if you can find election jurisdictions to actually use it and to see what the costs and benefits are, see what it does to the overall risk and deployment in the use of the systems. I'm really getting at (b) but it flips back up to (a) as well, that once you create the classification scheme try to establish some kind of a prototype environment in which several jurisdictions would be willing to implement it.

DR. KING:

That's an excellent suggestion because I do think proof of concept is an important next step in any good idea.

McDermott had a comment.

MR. COUTTS:

Basically what we're trying to -- I think what we're trying to accomplish with this matrix is to ask two very simple questions. Who is testing this change? And to what level are they testing it? We will -- I think that a safe assumption is that the vendor is always,

always going to test a change once it's being done without their knowledge, which I don't think is actually going to happen. But the question is does -- can the State simply test their change or does it need to go up to the VSTLs and the EAC? And then to what level? Are we testing at a component level or does it need to be system-wide? So, you know, scope and who performs it, these are the two questions that we're trying to ask -- or answer with the classification. I think that -- or at least that's my understanding of it.

DR. KING:

Okay. And that looks at the use of the end product classification, as much as the classification itself.

MR. STENBJORN:

Right.

DR. KING:

Let's go back and talk about the -- some of the attributes of the schema. We've heard again that expression class one, class two, et cetera. I just noted Pete you've got your flag up, so let me go to you.

MR. MARTI:

I was just going to say were you looking at what the benefits what we're trying to do? The one comment that stuck in my mind is to shorten the qualification time. I mean that seemed to be above the -- but this is the one thing that I see as one of the high level -- if you wanted to say a high level, not to say how to do it, but basically say that there's a problem to qualify -- re-qualify a COTS or get a change to get it fixed and get the system up and running. You're -- up at the top level you're trying to reduce the qualification time. It's

going to reduce the cost, et cetera, to get the system back up. But I -- that's what I thought you were at was a very high level without getting into any kind of details. It's just sort of an umbrella statement. I just wanted to bring it up because that's where we were at at this point.

DR. KING:

I think that's an excellent point because, obviously, if the schema and the subsequent implementation adds to the time of qualification, it would not be acceptable. So I think identifying those benefits is a good idea.

Ed?

MR. SMITH:

Merle my colleague at Dominion, Ian Piper, took some time out of his Valentine's Day evening last night to derive some thoughts around a schema. And, Ian, correct me if I put words in your mouth as we go, but he came up with a number of categories that differ conceptually from what we heard from the FCC and the Navy application of COTS in terms of he used parameters such as application. Is it internal or external to the voting system? And I'll send this around, if you wish. Function; critical, major, minor or trivial. Complexity; complex, simple active, simple passive or just plain simple. How it was prequalified, some things like that, and was even able to give examples, you know. For instance, a critical would be affects accuracy, ballot capture or other critical VVSG requirement down to simple which doesn't affect any critical, major or minor VVSG requirement. And then even so far as to place

numbers next to these that you could then sum or what not to to get

some sort of a weighting that could then result in a decision.

DR. KING:

Okay. And you will forward that onto Brian?

MR. SMITH:

I will forward that to you Brian for dissemination.

DR. KING:

The key word that I heard there and I heard several times in the

discussion yesterday and today is functionality, in that components

that alter the functionality of the system or directly impact the

functionality of the system would clearly be in that next tier of the

non-pure COTS components; the class two or whatever the

standard identifier is for that. So I think that kind of dimensioning of

the COTS components is instructive and useful because it puts

them into context that will give guidance for the actual application,

not just the initial evaluation of the product.

     We talked about a spectrum, that COTS exist on a spectrum

of functionality. I thought I heard consensus of that. And so would

a guidepost for the EAC on their subsequent model make sure it

includes some method of addressing that spectrum, the gradation

between functionality and interchangeability?

MR. STENBJORN:

I think some definitions would be required about those various

components, the various processes and what function they serve

and then some subdivision of those functions to say that they fall

into vote capture, vote tabulation, supportive ancillary. I mean

those are the kind of functions that I see because, you know,

something that would seem ancillary, like rollers on an optical scan

unit, really end up being critical to the ballot capture process.

They're not really -- they may be ancillary to the vote -- the image

capture, but they're not ancillary to the voting process. So there

would be some level of functionality -- some classification of

functionality in the outcome, in the real process. That would be

something that probably would be helpful.

DR. KING:

Okay. Ed you had in that discussion yesterday when we were

talking about a spectrum, you talked about a table approach. Could

you recap what your thoughts were on that?

MR. SMITH:

Sure, I really didn't flesh that out excessively. Ian's model is also

tabulated in the spreadsheet. But you could have -- you know I just

envision on a page somewhere in the standards some day or in a

program manual some day that you have, you know, some rows

and some columns, probably not very many of each, that give

different classifications based on whatever parameters make sense

and give examples of those perhaps in another row if you're going

to across via column. And the bottom line is here's what sort of

testing is required. And maybe just above that is who makes those

decisions.

So some things that classify COTS and then take it through

the lifecycle from it's in -- it's promoted out of the vendor to the rest

of the community, in this case really the EAC process, and then

what is the EAC going to do with it or expect the vendor to do with

it.

DR. KING:

Luis?

MR. TORRES:

I kind of like what you just said. Who makes that decision part of that table? Does a jurisdiction make that decision? Does the Division of Elections make that decision, you know? Who is it? Does the vendor make the…

MR. SMITH:

I think you try and eliminate the decision making and you say…

MR. TORRES:

Yes, because it spells it out.

MR. SMITH:

…and you say, "If it looks like this, it's this and you do that." And you eliminate as much gray as possible to make life easy and well defined for all parties.

DR. KING:

So ownership of that decision is an important part of the matrix, adds confidence. And I think that's something that you've talked about several times Paul is one of the end products of this process is to increase voter confidence in the process.

Brian has his flag up.

MR. HANCOCK:

Thanks, Merle. Let me just take this in a slightly different direction, although with the same goal certainly. Something we talked about at lunch a little bit and something I've been thinking about, but the schema is a good idea and we may eventually go there. It seems

the more I think about it the more complicated it gets though, and I'd rather look at something a little easier.

And one of the things that I thought about was developing an EAC manufacturer working group that would essentially determine trusted COTS providers. We initially would not bite off too much of that elephant that Merle was talking about but do some simple things. Add like perhaps the LCD screen providers, right? We get together with you all, let's take a look at the -- you said there aren't a whole lot of them. Let's look at the manufacturers of LCD screens and see who we think can provide for the industry, you know, the most trusted service, sort of best of breed out there. And for many instances we'd put up, you know, a list and then you all could go ahead and swap those things out, more or less, as needed. There would be a lot of details to work out there, but I think that's just a slightly different way to approach the same problem.

I don't know if anyone has any thoughts on that or…

MR. SMITH:

It is, especially coupled with your earlier concept of you can switch off within a series.

MR. HANCOCK:

Um-hum.

MR. SMITH:

You can say, ""For these vendors of LCDs as they move forward with part numbers in the same roadmap series of whatever dimension panel it is, you can go with impunity" or whatever testing,

whatever it is. That makes a degree of sense. But like I said, it covers a portion of the problem.

MR. HANCOCK:

Yeah, right.

MR. SMITH:

And a pretty salient portion.

MR. TORRES:

I agree with the series analogy because when Merle was talking about his motherboard issue with his Dell servers, you know, he had all these motherboards, purchased them thinking that he was going to have to replace the motherboards, but when he went to replace them they didn't work. Well I found that working out with Dell. I had GX270s and I found within a three-month span that GX270 motherboard had two different unique configurations where the CPU from one model would not work in the other configuration. So even though the specs were the same, the configurations were slightly altered.

DR. KING:

Okay. Let's look at on question eight which was the suggestions for pilot projects going forward. Glenn I think has already brought up the suggestion that in -- if a schema is developed that attempts to classify COTS components, then perhaps pilot projects could be identified in which that could be done. Certainly I think Brian your suggestion of a working group of manufacturers that lends itself to a pilot project.

Are there any other suggestions for research agenda or related topics that the EAC could benefit -- or I should say the

election community could benefit from the EAC directing or sponsoring research projects related to COTS?

MR. NEWKIRK:

Brian this is Glenn. I had a question for you. Yesterday I mentioned the importance of configuration management, both for security and just all kinds of operational requirements as well, regardless of whether it's COTS or not. Are there any guidelines that you're aware of for configuration -- for keeping records on configuration of voting equipment and voting systems that are actually deployed in election jurisdictions, and that configuration management would include records of maintenance and repairs? Are you aware of anything like that that's out there?

MR. HANCOCK:

I'm not currently aware of anything that exists. I mean I'm not sure what the manufacturers might have internally as far as their products are concerned, but certainly outside of that process I'm not aware of anything available.

MR. NEWKIRK:

Okay. Well, then, I guess I would just like to kind of throw that one out into the mix is again maybe just the development of -- I don't like the phrase necessarily "best practices." Let's go ahead and call them guidelines, not standards, but guidelines or recommended practices for keeping track of what goes on with pieces of equipment with your voting system, even if it's going to be plug and play.

This gets back to the old security maxim of fundamentally and disaster recovery maxims. You can't secure and recover a

system if you don't know what it is. And so the idea being that –

and. believe me we've found, and Merle I suspect you've seen it

too in your work across the county, that you would be surprised at

what people don't know about what is in jurisdictions. Literally, and

I know this will give Paul and Luis heartburn to hear, but I mean

there are people who don't have a clue what motherboards are out

there in some of these devices and -- or when it was repaired and

when it was replaced. And I just think that somebody having a

good set of practices so people would know what it is expected or

what would be expected, again getting back to that Dell situation.

When you call Dell, they can come pretty close to telling you what's

in your machine, if anybody has worked on it from Dell or anything

like that. So I just think it would be useful to have a set of very

simple, very straightforward guidelines, recommended practices, for

keeping track of the configuration of all the equipment and all the

software that's out there so that people will simply know what they

have.

DR. KING:

I think that's an excellent suggestion, Glenn. I have a couple of

flags up here from folks at the table. Luis and then Paul.

MR. TORRES:

Well exactly what Glenn said, you know. In the Dell situation the

serial number, the service tag number was provided for the system.

But when they looked up the system there is an image that Dell

customer service reps pull up. Within that image there was actually

a note that was placed within the image that described that this was

a modification motherboard. So I see that the vendors know that --

all voting equipment know that they have to come up with a type of system. And I can tell you the vendor that we have is making strides in going that direction because it helps with audit data. It also helps with knowing, tracking serial numbers that constant problems. So I see that the voting system industry is making those changes. And I'm glad that they are and they're not leaving it up to the jurisdiction level because before they ever started making those strives to get to that level we had to keep track of it at the jurisdiction level. And that's another piece that we have to manage.

DR. KING:

Paul?

MR. STENBJORN:

Maybe my mind has just been too deeply buried in structured data recently, but I see a data issue here. The question is -- and Glenn it sounds like a fabulous suggestion if we can get the vendors to maintain the dataset or provide the dataset or provide some sort of universal dataset of what the motherboard revisions were installed in which machines and which have which serial numbers and when vendors, like Printelect, which is an East Coast repair organization that ES&S uses, replaces out parts that they would update that dataset, which to my knowledge they don't do. And then to have some mechanism for the jurisdictions to be able to maintain deployment history, L&A history, service problems, some sort of service ticket history. That would be a great dataset to capture and it would be a great pilot project for a small number of jurisdictions to begin working in concert with the vendor -- the manufacturer, excuse me, and then what other vendors would be incorporated. I

think that would also benefit us in tracking known issues with specific COTS that are ancillary to it. I think that's something which is really relevant to what we're discussing. But then we get to the question of who manages the data? Who collects the data? What mechanisms are used to collect the data? Because in Virginia I tried to do that, something similar at the statewide level, and just capturing basic equipment information to know which -- something -- more rudimentary information. Just basically what voting systems, what individual voting machines were deployed, what the serial numbers were, what the firmware revisions were and what histories these machines had. It was two years of hitting my head against the wall there, but we captured some level of information. But just coming up with some data -- but the process was to create -- first to understand what the data looked like and create a mechanism to collect this data. And that -- so I'd be willing to be a participant in that.

DR. KING:

Okay. Well I think there are important benefits of such a data collection and dissemination system. And I think it's critical that those benefits be communicated in front of the decision to implement such a system. And I think that -- going back to your experience Paul, that's kind of a critical step zero in many of these processes is to help people understand the benefits that are associated with having that data.

There's another thing that I've heard throughout this session, that some of the issues that we're dealing with with COTS can be addressed in procurement strategies. And I'll use as an example

motherboards that require -- even when they're implemented in comparable systems require a different acceptance test protocol because of some uniqueness in the system. Addressing that in the RFP so that we can identify those machines and incorporate the appropriate test protocols in is something that we've kind of shifted over and made an obligation of the vendor as part of fulfillment of the contract. So I really like that idea. And I like the idea of identifying the benefits that would be associated with that so that you're selling the benefits of the project, not the burden of the project to the participants.

Okay, I've been handed a note that says we need to take a short break because we've got a couple of logistical issues that need to be addressed in the room. I do want to keep moving on task because we've got a few more summary steps. But would it be okay if we took just a short five-minute break or so? And then we can get back on task and maybe finish up a little bit early. Is that all right? Okay, Glenn can you hang around for a little bit?

MR. NEWKIRK:

No problem.

DR. KING:

All right, thank you so much.

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[The roundtable panel recessed at 3:20 p.m. and reconvened at 3:29 p.m.]

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DR. KING:

I'd like to call the roundtable back into the session. Glenn are you with us still?

MR. NEWKIRK:

I'm still here.

DR. KING:

Excellent thank you. The first thing is we are going to wind this up in the next 30 minutes, so we have certainly a goal in mind here.

And when we took our break we were talking about the research projects, any kind of pilot projects that we would like to see come out of this project. And I think we talked about a couple. We talked about a classification schema. We talked about possibly a Wiki tool that might be useful. And there may also be subsequent roundtable discussions using this information to kind of fine tune and focus and move to the next level of definition.

Any other suggestions for pilot projects, research projects or next steps coming out of this project?

MR. SMITH:

What are the EAC's plans for additional roundtables or other meetings? There was a working group discussed earlier. Let me ask that question before we delve -- because that makes sense that the Commission has the lead on this situation.

MR. HANCOCK:

Sure thanks, Ed. I think, you know, first of all we need to take the information we've collected over these two days, you know, we'll work with Merle and synthesize the information we have. I think we have a good starting place with the definition that we discussed earlier this afternoon. I think that's a very good, workable definition. We'll need to take a look at the pilot program ideas that we just talked about. And perhaps what we'll do is get a few straw man

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schemes laid out so we can have something very specific to talk about the next time this group meets, or a group similar.

I think one thing that perhaps we should at least touch on before we leave today is for any additional meetings should we have additional folks that weren't invited to this meeting? And if so, who should that be? Are there complete groups that we're missing? Are there other folks that you all know of? Let's just explore that just for a moment.

MR. SMITH:

I think this constituency was fine, except a VSTL would be handy, especially as you start delving into the details of [inaudible] conceptual.

MR. HANCOCK:

Good idea. Anyone else?

MR. TORRES:

I would say an IT consulting firm that actually researched this type of issue that is out there, the COTS, testing the COTS. There has been books written by many of these folks out there and have done great case studies.

MR. HANCOCK:

Do you think we should get a broader range of particularly State election officials and maybe some additional locals, as well? You know there's some States that we know are very much into determining what goes on. California comes to mind, Texas, a few other States, Florida obviously. And so that's something that I'd probably want to do.

DR. KING:

What about COTS suppliers, some of the more commonly used

groups? You mentioned Samsung, Dell.

MR. HANCOCK:

We tried that one.

DR. KING:

Um-hum.   Would that be beneficial?

MR. TORRES:

Yes.

DR. KING:

I sensed in some of the discussion we were expecting the vendors

to indirectly speak for some of your suppliers, and I thought it would

have been better had we had those suppliers at the table.

MR. HANCOCK:

Right, we did invite Dell Federal Systems. They were unable to

show up today, but I think we'll try that again in the future.

DR. KING:

Um-hum.

MR. HANCOCK:

And maybe we can work with you all and see some of the other big

suppliers that maybe are fairly commonly used and see if we can

get a few of those folks at the table, as well.

DR. KING:

Okay? The last thing then I like to do at each roundtable

discussion is to give the participants an opportunity to summarize

their own point. Over the past two days each of us has certainly

made a contribution, but we've also heard other viewpoints and

have had an opportunity to reflect on that. And so I just like to

make sure that at the last step, and we're going to go around the table, we're going to start with McDermott, and Glenn we'll include you also, that -- give them an opportunity to have their final say in what is it that you would like the EAC to take away from this engagement? What would you like your colleagues at the table to take away in terms of understanding the COTS issue from your viewpoint and anything that you would like to make sure sticks in the minds of the participants at this table regarding your perspective on COTS.

And we can just kind of move around the table as we do that. I get the final say on that and if I could start with McDermott.

MR. COUTTS:

Well I have to say that one of the most enlightening things I heard was about how the voting machines are perceived as machines rather than electronic equipment which was a bit of an eye opener from my perspective as far as how to manage the replacements and upgrades. As Merle pointed out, my experience has been a little limited in that respect.

I think if there's one thing that we need to take away from this, and I think that it was made very clear by Pete, was that what we need to do is decrease the time to find and replace these COTS components. We need to decrease that time. It's going to happen. The speed of the -- the fact that they are commercial for the most part in the hardware realm means that they are going to move faster than voting. And it's going to happen. So as much upfront work that we can do to speed that process up the better off we are going to be.

DR. KING:

Okay, thank you McDermott. Paul?

MR. STENBJORN:

Thank you, Merle. And thank you Brian and thank you Merle for leading this. It's been really instructive. You know some of my perspectives have actually changed over the last couple of days, so I really do appreciate that.

I think that the one lesson to be learned is to find ways to streamline the certification to a greater predictability on the part of election officials, and understanding that the costs are borne by local election officials regardless of what model we come up with. Whether or not we put additional testing requirements or reduced testing requirements on the vendors, the eventual costs or savings are going to be passed along to the voting officials. So I just -- the one thing that I'd like to walk away from this with is an understanding that additional -- placing additional technical requirements on the local election officials is probably the wrong place to place the technical requirements. I think providing standards and guidelines would be very helpful, but placing additional requirements on them would probably be misplaced.

DR. KING:

Okay thank you, Paul. Pete?

MR. MARTI:

I first off want to thank you very much for having me here as a representative for the military, and also to speak from commercial experience. It's been very eye opening as to exactly all the problems and I think it's a hats off to you two to pull this together

and the way it's been conducted in a professional manner. I'm very impressed. And it was great to meet all of you. I learned a lot about your market and the problems and how you're addressing them. And I think the biggest thing is, is carry on. I'm very impressed with that you're addressing the problems and that you're working for a resolution.

DR. KING:

Thank you, Pete. Glenn, could I turn to you now?

MR. NEWKIRK:

Sure, just two quick points. I think for me I think it's pretty clear that the impact of COTS on voting systems development, testing, certification and deployment has been -- probably the impact has been higher than actually I thought it was coming into the meeting and I think it will probably even be higher. I think it has been completely refreshing that we've spent two entire days and I haven't heard anybody mention the iPad, which I think is just absolutely, wonderful because I expected somehow that was going to come into play. It seems to be coming in everywhere else. And I think the timeframe for all of these elements; development, testing, deployment because of COTS and the demand -- the expectation is a better word, the expectations that are being brought about by the possible deployment of COTS I think that those timeframes will continue to shrink even more.

DR. KING:

Okay thank you, Glenn. Luis?

MR. TORRES:

Well, when I first got invited to this meeting I was issued the list of questions and I answered the list of questions. And as we started discussing the questions, my take and my understanding actually changed from just the roundtable discussion here.

But we know the impact of COTS. We know that it's a moving target. And one of the things that helps us at the local jurisdiction level is that we have to streamline the process somewhat to get these minor changes to a product that is a commercial-off-the-shelf item. We have to streamline that process, because in our business the election date's not going to change. We have to still conduct the election.

And the standards and guidelines, the open communication has to be there. We talked about vendors making adjustments and communicating with us at the local level, but we also want to see it at the State level. We want to see it at the EAC level. Just recently I've had dialogue with the EAC. I've been in the elections business for 14-1/2 years. I've never had dialogue with the EAC until recently. So that dialogue, that communication should be there.

DR. KING:

Thank you, Luis. Ed?

MR. SMITH:

Well first off, thank you Brian and thank you Merle for allowing me to come and express my views and join into the conversation here. I thought it was very, very productive. I certainly gained perspective through the course of these last few days, particularly with respect to how COTS affects the local election officials. And one of the messages that I'll be bringing back to our development

community is how decisions they make today, or don't make, affect the customer base years down the road in some ways that they may not think of, some ways that are certainly not apparent when you're in a lab thousands of miles away from Florida or from Washington, D.C. So I'll certainly be taking that message back.

I think one of the things that I think we can do, and I think that we're going about in the right manner in eating the pieces of the big elephant at a time, I think we can evolve to some sort of a scheme, a matrix, a decision making scheme towards COTS and its testing in the certification process. Something that the developers of systems, the VSTLs, the public and anybody who is interested and has a reasonable, tenable understanding of the situation can review and say, "Yes that makes sense," or even if you disagree you at least understand what's going to happen based on a given set of circumstances around a given COTS implementation. I think the pilot programs and the steps that we're taking now to walk before we attempt to run are the right answer. But I do think and look forward to a day where there's a simple or complex, whatever it ends up being, matrix surrounding how we're going to lifecycle different COTS implementations.

So once again, thank you. I look forward to the next one.

DR. KING:

Thank you, Ed. Brian?

MR. HANCOCK:

Thank you, Merle. Let me first thank you once again for taking the time out of your schedule to do this difficult task. I know it's like herding cats sometimes, getting everybody's opinions together and

trying to synthesize everything that comes out of a two-day meeting like this. But great job once again.

And on behalf of the U.S. Election Assistance Commission, our two current Commissioners and our Executive Director, I want to thank all of the participants over the last two days. I know all of you to some degree, and I know your schedules are extremely busy. So we thank you for that.

Also, this is not going to be a one and done. Ed you can be sure that there will be a follow-on to this. And I'll be keeping in close contact with each and every one of you about the upcoming meetings.

But thank you once again.

DR. KING:

Okay thank you, Brian. Well I'd like to make a few closing comments and then, good to my word, we will be out of here before four.

I appreciate the patience of the panelists. I appreciate the technical support of the folks behind the cameras and behind the transcriptionist. And I also thank James Long for his help in getting me prepared for this session. He and I met several times and I do appreciate that help, James. Thank you.

A couple of things that I take away from this workshop that I will clearly be thinking about for a long time to come, and the first is the need to learn from others. And as I listened to the FCC and Pete to your comments, I'm intrigued by the benefits of learning from others who have already addressed this issue. Perhaps it's not quite the same in their industry. Perhaps there are differences,

but I'm encouraged and I'm grateful for the participation of Bill and Pete in this process of helping us learn from the ground that's already been plowed by your organizations.

The second thing that I came away from is an appreciation from each collection of people here today, whether it's the election officials or the voting system vendors or the testing people, is that process needs to be looked at end-to-end and that only looking at it from your perspective will not give you the insights that's needed to optimize the system. And I think in a very important way that the EAC understands that and that the EAC is a part of that end-to-end piece. And it's by coalescing all of these viewpoints and all of these issues that the final solution that's implemented will best address all of the needs of the different groups here at the table.

I'm always reminded of the importance of leveraging goodwill, and what I heard over these two days is there a significant amount of willingness on the part of people to step up to this problem. The vendors have made suggestions about things that they can add to it. The jurisdictions have. The testing folks have made suggestions. And certainly, the EAC has put forward some ideas. So I'm encouraged by the opportunities that are presented here where we can leverage, not only the knowledge of our colleagues in this process, but also leverage the goodwill, that we recognize this is an issue and we want to work together to get it fixed.

With that said, I will again thank everybody for their participation in this process and look forward to working with you in

the next iteration of the roundtables or other projects related to COTS as we go forward.

And with that, I'll adjourn this roundtable. Thank you all very much.

MR. COUTTS:

Thank you.

MR. TORRES:

Thank you.

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[The roundtable panel adjourned at 3:48 p.m.]

bw/add