Virtual CRT Golden Clouds

[Riki Ellison]
Aloha, ladies and gentlemen, from Hawaii, from the University of Hawaii, from our Artemis program that's here. We are here, just flew in from Germany last night, but one of the most wonderful things I saw this morning was the sunrise over Diamond Head and a cloud, a golden cloud over Diamond Head. I know there's some fate here, and it was also pretty cool to fly, whatever that distance was, it was 12 hours to get to San Francisco across the world, and there were clouds, you were blanketed by clouds. It's a friendly reminder, especially going into Hawaii, these vast areas that clouds are everywhere, blanketing the earth.

This is our 84th virtual on the Golden Clouds for America. I am Riki Ellison. I am the founder and chairman of the Missile Defense Advocacy Alliance, founded back in 2001, excuse me, 2002. Also, real strong here in the Pacific. I'm from the Pacific, and so it's just awesome to be here for that.

We have just been over in Europe and involved with the Eastern flank deterrent line, which is a nine NATO nation capability integrated across the entire 4,000 kilometers of the Eastern front, and also of the Eastern Sentry that Grinch just put forward two weeks ago to fight the Russian drone incursions. And what's happening over there is it's about being able to get mass. Mass. And to be able to defeat the Russian mass of cheap, attributable, distributable drones.

And we can't, we can get away with it, and we probably will a little bit with we have these exotic systems. We have systems that can take 10, 20, 30, maybe 100 down, but that doesn't solve the problem. That doesn't solve the deterrent problem. And I like to quote C.D. Donahue, who is a land Europe commander, that his mission set for everybody is to be able to defeat the mass and then enable overwhelming violence on them. And so that is deterrence. We talked about that earlier. The deterrence is to be able to apply your offense against anything and be able to get through it, the political will to do it, and the ability to defend from a counterattack.

So, the Eastern flight deterrent line, just on this shot, has to have an ability to share data across the entire nine and massive amounts of data. So that is driving a cloud solution. And a cloud solution is being used very effectively in Ukraine, bringing all its data in on a daily basis on that.

So, NATO is moving forward. They're behind with creating their own cloud. The US with EFDL are gonna be aggressively in front to be able to create that capability fast.

And when you look at this and then you step back and you look at the mission for Golden Dome, which we're gonna spend $175 billion in three years to defend the American homeland, the amount of data that you have to collect and process and be able to have a C2 to distribute effectively to your effectors is massive, massive, massive, massive. And they, [General] Mike Guetlein, the single most valuable thing about Golden Dome is to create the effective C2 that can bring all these data points together, number one on it.

You can sit back and look at this. If you compare this to a chess game or chess pieces, we're not playing chess, we're playing three-dimensional chess, we're not playing three-dimensional chess, we're playing quantum chess. And we're real good. We have the best rooks, the best bishops, the best queens. We can play with those better than anybody in the world, but we

don't have pawns, we don't. And pawns are critical to enable both offense and defense and territorial terrain and cheap and attributable. Russia has pawns, China has pawns. And we're here in the Pacific where that threat of mass is greater than the Russian threat of mass. And this is not gonna be solved with stovepipe service, C2 systems, and not gonna be solved with systems to systems and integrate that. It has to be pushed out to the best in the world. And the best of the world right now, and this is commercial. And the commercial ability to process with the supercomputer of the cloud, which means they can scale better than anybody. They can store data better than anything, and they can compute data.

That's what we have to do. And this discussion today is about, is educating that cloud perspective, and really the revolution that our military, that our world has to go through to create cheap attributable capabilities in mass. In mass, and be able to operate that data.

So, we are very honored today to have the former NORTHCOM commander, General Glen VanHerck, who recently gave up that, I'd say recent, but I think it was last year, to Gooey, and Glen has been a proponent of this in his time. The first time I met Glen, four or five years ago, in his office as NORTHCOM commander, this, it's not about, and I was coming to him about hypersonics, and cool ass weapons, and cool sensors, and it's not about that. And even we have these gaps, it's not about that. And he's led that charge. He's led that charge all the way through. He's been on it. He's been on the right angle on it. He believes in this, and as the NORTHCOM commander, you're not gonna get better expertise as a commander to be able to handle that kind of data coming in.

And then we also have, on the Pacific side, General Charlie Flynn, retired, used to our Army Pacific, who's all about trying to collect mass in the first island chain with his ally and partners, and is also equally frustrated with the current capabilities that we have that not enable us to do more than bilateral capability.

We have to go big, and we have to be able to move. So, we have these two experts on that. And then at the end of it, we have our board member, JD Gainey, who's also another Pacific guy out here that will ask questions. But we also have a class of some great senior leaders here that are gonna ask questions.

So, I'm gonna start it off, and Glen, you run the way you wanna run with it. So, ladies and gentlemen, General Glen VanHerck, the floor is yours, sir.

[Gen. (Ret.) Glen VanHerck]
Hey, thanks, Riki. It's great to be with you again, talk to you. Congratulations to your Artemis and SHIELD team for what they're doing, and thanks for what they're doing. It's great to see Charlie. Congratulations on your retirement, Charlie. I wish you the best.

So I do appreciate the opportunity to talk about Golden Dome, but more importantly, about the foundation of Golden Dome, and I would say the foundation of the future of the way we're gonna fight, and that's combined joint all-domain command and control. And Golden Dome has the opportunity to shape and lay the foundation more broadly for the entire department for what I would call, not a cloud, but a common data layer that takes data from various sensors, fuses that data, uses software-driven capabilities such as artificial intelligence and machine learning, places that into that data layer, which is able to be pulled. And so, I look forward to having a conversation about that.

When I say combined all-domain joint, or combined joint all-domain command and control, I think that combined is really important, Riki. Combined is talking about our allies and partners, really, and I'll expand a little bit more, but whatever we build, whether it be for Golden Dome, whether it be for Europe, it's a global problem today, and our allies and partners will contribute significantly to our deterrence capabilities, our ability to operate in crisis, our ability to operate in conflict. They bring incredible domain awareness capabilities. They bring unique authorities that we can utilize, and we need to make sure they're plugged into the architecture that we build going forward.

The joint is just as crucial. That's all services, all services, but we can't build this as a bunch of service-centric capabilities. We must build this as a department and global approach. Today, our problems are global in all domain. You know, the lines on the map on the UCP between the combatant commands just create gaps and seams and vulnerabilities. I would tell you that Homeland Defense does not start in the homeland.
Although Golden Dome is focused on defending our homeland, Homeland Defense starts forward with the fellow combatant commanders and allies and partners, generating effects forward day-to-day in crisis and in conflict to create deterrent options and, if required, defeat options.

So we need a global system that allows us to see across all domains, to fuse data to be able to generate deterrent options and, if required, defeat options globally, and that's what we're really talking about, and Golden Dome has the opportunity to set the foundation to be able to do that.

For the homeland, more broadly, this is not a DOD problem. To defend the homeland, certainly DOD, but you need the Department of Homeland Security. You're going to have to have the Department of Transportation. You're going to have to have the Department of Energy, the Department of Justice, and more all plugged in, Secret Service, Capitol Police. They all contribute, and I could just give you the example of Spiderweb, where Ukraine utilized their asymmetric means to generate effects strategically with tactical assets in Russia, as the need to collaborate across all agencies to defend their homeland. To stop something like that in here, it wouldn't be just DOD. It would be from the local level to the state level to law enforcement to intel agencies to every agency that we have to be able to stop something like that.

Now, I often hear the term system of systems or the terms and the need to connect systems. I couldn't disagree more with saying that. When we say systems of systems and connecting those systems, it leads engineers and technical experts to think that we have to connect every system to every other system, and that's unrealistic. What we really need is an approach for those systems, and let's just call them sensors. Let's call them domain awareness capabilities. They may be cyberspace. They may be radars, terrestrial. They may be undersea capabilities. To share their data to a common layer, I won't call it a cloud, a common layer that then various nodes from C2 decision makers to the tactical edge effector can pull down proper data and apply the proper application to that, and that's what's important.

It's not a system that does that. It's multiple applications created by the users to pull down the appropriate data from the common data layer that everybody sees, and each of those applications can be manipulated for whatever you need.

So, that's a different approach than we're used to doing. We're used to handing it to a single prime who builds a single system or connects systems. This is not gonna be that, and that's

very important as we move forward. And I can give you another example of that so people can understand. So C2BMC, that's your command and control battle management system for our ground-based interceptors today and other things. C2BMC won't dramatically change. C2BMC will push data from the sensors that feed it into this common data layer and receive data from the additional sensors it would benefit from, but C2BMC, as an architecture, will stay in place to still command and control our missile systems. That is how this would work.

So, I don't think this is a technology problem. Most people, when they look at this, they look at it and they assume that, gosh, we gotta create all kinds of hardware capabilities. No, Google, Amazon, others have figured out the data problem. Our problem, I would tell you, is a data problem, and more importantly, a culture, policy, and law problem to get all those right, to move beyond where we are today, to be able to put that data we're talking about into that common data layer at proper classification levels, and that can be done. There's technologies to do that today.

We also have to make sure that that data layer is resilient, secure, effective 24-7. Again, this is not a technology problem. We've figured out how to do this, and when I talk a data layer, I'm not talking a single location that makes it vulnerable. We're talking geographically dispersed data repositories that are able to provide resilience and backup storage that are all talking to each other simultaneously to give you the network and the foundation that you need. That'll help take away some potential latency.

And we're not talking about delivering a thing here. Most primes in the department is used to being able to build ships and tanks and planes, and Congress has a propensity to wanna see those types of things. We have to figure out how to articulate what it is we're talking about that enables those types of things they're used to seeing, which is the foundation for it. But it's not building a thing. It's connecting things that have been built in most cases, and there will be some new things.

So, I like to say it's sensor-sharing data through a layer with the applications pulling that, and it could be from decision-making to the generation of destruction for the effect, and that's important.

I would also point out that by doing this, the model, and this is an opportunity to reshape how the department acquires capability. You're not gonna send out a request for proposal, keep it stove-piped amongst contractors, end up with a single prime contractor that builds this architecture. You're actually gonna have to generate a way to get collaboration across those contractors, those primes, so they all are seeing the problem, that then you also look out to small business, medium-sized business. That's where the true innovation is happening, and figure out how you're gonna bring them in and help them scale. And the concept that I've talked about, and I would say it's not really a concept, it's well beyond that, you can have multiple companies building the applications as long as they have access to the data, and multiple companies building the data layer, so you're not reliant on one company.

And this is really important, Riki. The government owns the data. The government has the decision-making. You cannot make it proprietary to any specific contractor. We've gotta move beyond that legacy way of doing business. We have to be the drivers of the data and own the data.

Let me just close here and turn it over to Charlie, but I just wanna say the value of deterrence of being able to look globally in real time to operate across all domains, inside any potential adversaries, observe, orient, decide, and act loop, their OODA loop, to be able to provide attrition to any act that they, or attribution, excuse me, any act that they may commit around the globe to show our capability, our resilience, our responsiveness. That is deterrence in effect. You are making them question their ability to be able to operate without you knowing, or to be able to operate ahead of you. Once you can demonstrate every day in campaigning crisis or conflict that you can do that, they now have doubt about being successful, and that is the definition of deterrence. Thanks.

[Riki Ellison]
Thank you, Glenn. I'm gonna ask you a question or two before I pass it over to Charlie.

Can you talk about the decision-making? I mean, you're the commander. The data, so it's gotta be AI. With all that, how do you have a single human in the loop, or how do you manage this from a human perspective, from a NORTHCOM perspective? If they're gonna be the guy in charge of the Golden Dome and the operations of it, how do we evolve to be able to gather all that data and have that man make that decision or woman?

[Gen. (Ret.) Glen VanHerck]
Well, today, when you share the data to a common layer, there are capabilities right now that exist with companies out there that utilize kill chain automation. For example, you know, in a future fight with the Golden Dome, where you may have threats in space going after satellites, threats emanating from space going after terrestrial targets, threats in the terrestrial domain going after terrestrial or space targets, hypersonics in the air domain going after terrestrial targets, et cetera. And you may use effectors across all those domains. So, a space-based effector may provide data on location for a hypersonic that cues a terrestrial effector to go after that hypersonic, or you may have a space-based effector go after it through laser or jamming.

A human cannot process all of that data in real time. It will require software-driven capabilities to make recommendations to prioritize across all of those and give you prioritizations. Ultimately, though, the human needs to make the decision on pulling the trigger, is what I would say, but based on those recommendations. So does that answer that question?

[Riki Ellison]
Yeah, no, it's just for people to understand, because that's massive data. So there has to be evolution of AI in the whole decision loop and we've been able to do it on certain domains and certain systems, but you're talking the whole thing now, which requires much more ability to be able to have cloud-type capability to handle that. You can't do it any other way. You can't do it with servers attached to different services and systems. That's what I was just trying to understand.

[Gen. (Ret.) Glen VanHerck]
You can't do it with 14 different stovepipe systems in a command center. As the commander of NORAD and NORTHCOM, I had 14 separate systems in my ops center that didn't talk to each other. Can you imagine trying to process all of that data in the middle of a crisis or

conflict and prioritize effectors and forces? No, the future has got to rely on software-driven capabilities to help you do that. And this is not rocket science, by the way. This technology exists today, Riki. Why aren't we using it? It's culture, it's policy, it's law. We've got to move beyond it.

[Riki Ellison]
And Glenn, on the other one, as you look from your perspective, how do you protect to ensure that Mike Guetlein can implement this? And I think he's going in that path of a consortium, just like you said, to create that innovation, to go fast, to go quick. Is that saying also that you could do the three major cloud providers and put them in a consortium and not pick one and just do that? Do we need to do that as well? Is that how you're looking at how we go forward with consortiums over sole prime contractors?
[Gen. (Ret.) Glen VanHerck]
Well, I certainly think there's a need at times for a prime contractor on certain vehicles or whatever. This is likely not one of those. I think you have to have options. And the FAR now with regards to acquisitions is going to give more authority to do that across the department, across the services.

So, I think this is a perfect example where we have to write a request for proposal, acquisition authorities to force a cultural change within the department, but also within the commercial sector to work on solving a common problem and to collaborate to do that. We can make this happen. There's no doubt in my mind.

[Riki Ellison]
I'm with you. I just think there's a lot of people that are organizations that may not want this to happen. We got to fight through that because of the reasons you said, right? And that's the challenge.

[Gen. (Ret.) Glen VanHerck]
I agree with you, Riki. Mike Guetlein has to be given the authority, not just the responsibility, the authority and empowered to have that authority across the department. If he does not have the authority to direct action, acquire capabilities to prioritize, or at least direct access to make that happen at the deputy and secretary level, then he's going to be having services tell him, no, we're not going to do that all the time. So it's got to be a collaborative effort to work together. Relationships absolutely matter here, but ultimately it has to come down to national priorities and department priorities, not service and individual priorities.

[Riki Ellison]
Thank you, Glen. We'll get back to you with questions at the end. Okay. One of my favorite generals, Charlie Flynn, right here.

[Gen. (Ret.) Charles Flynn]
Great. Riki, thanks.

[Riki Ellison]
Alright, buddy, you're up.

[Gen. (Ret.) Charlie Flynn]
Glen, great to see you. Always good to hear your insights there.

JD, great to see you again. And Riki, just hat tip to you for what MDAA does, the education, the training, the outreach, the advocacy. It's a very unique organization and I'm thankful for the heavy lifting that you do and the team does, really across the globe.

So a number of things that Glen mentioned, and I'll maybe add a little more meat to some of the concepts or some of the thoughts that he expressed there. And I'll lay this out in sort of three sections.

The first one, and Glen used this term, the foundation. In my view, we have to shift to very cheap attributable sensors using COTS solutions, COTS hardware, and open-source software, low risk, high volume data collection. That's got to happen early on. And then to use like a blood dye analogy, we have to put our data through these sensors so we can understand the raw technical health of the data networks that we have and to understand where our policy constraints are.

Okay, then the third part of this is, those sensors have to be these data generators and they have to drive the design of the future data sharing systems with real world inputs from forces forward. I don't really care where they are, but they have to then feed what Glen was talking about and his problem set that they'd had before in NORAD NORTHCOM, because at the end of the day, we have to protect the homeland. So on the foundation, in my view, the strategic goal of what I was just outlining, cheap attributable sensors, put a blood dye analogy, I'm using just a blood dye analogy to rip through these sensors so we can find out what the health of it is.

And then data generators to kind of be able to fuse all this stuff together. The strategic goal here is we've got to get away from point defense all over the place and have area layered defense. And I'll talk about layers a little bit downstream from where I'm at right now.

So, we can't afford to do point defense all over the continental United States, all over the globe, it's just, it's not affordable. So in this particular part of my commentary on the foundation is that the strategic goal needs to shift from looking at this through a series of point defenses and then get into an area layer defense using cheap sensors, attributable, blood dye analogy, data generator. Okay, second section: infrastructure. And Glen mentioned a little bit about this too.

So a couple of bullets here. I think we need to go commercial first, but not commercial only. And why do I say that?

We have to use the commercial cloud as our primary path for that data, but it's got to be augmented by some of the mil-spec systems that are exquisite because we have to be able to protect some of those things that we have. But I'll say it also, second bullet on this, it's got to be open and have a federated design. We have to avoid vendor lock-in.

We have to build open standards and we have to build those open standards so our allies and partners can plug in and contribute, not just plug in and do what they got to do, they need to plug in and contribute so they can see what we see and we can see what they see. And then the third point on this is, we really need to focus on not just the data, but the data movement. In other words, prioritizing moving the data at scale across our partners.

And we have to do that before trying to connect any of our old and isolated systems. We have to do that first. Okay, so what's the strategic goal of the infrastructure part?

We have to iterate all this stuff at the edge. It's got to get out of labs, it's got to get out of test centers and it's got to get into the hands of operational commanders with capabilities that are forward and they have to iterate out there at the edge so we can quickly adapt and get out of our slow software policy over-regulated game that we have going on sometimes. We just can't wait for perfection, okay?

Okay, the third part here is, we need to seize the greenfield or a blank whiteboard. And what I'm saying is, we have to start with modern open commercial tech, we don't have to try to build out from our oldest and most restrictive systems, which we tend sometimes to go to those old restricted systems and build out from there. No, we need to do just the opposite and start with modern, open communication, commercial stuff.

It's already there, it's already available. Like I said with the infrastructure, commercial first, not commercial only, but we have plenty out there that can help us do this. One point I'll harp on that Glen mentioned, layered.

And I'll say layered, not bolt-on. And what do I mean by that? We've got to integrate the exquisite high security systems on top of a flexible and modern foundation, what I was talking about in the first section.

We have those things, but we have to build out the other layers of this with those sensors to be able to pull all that data in and then start fusing the data and then distributing it across networks without having to do all these cross-domain solutions and give a bunch of excuses about, well, we can't do that because we need this protected. That's why Glen ended up with 14 systems. Or we had the same thing out in defense of Guam, really across the globe. We just can't afford to do it anymore.

And then I guess the third point I'd make on this one is the old way is just broken. The traditional approach is too slow.

It creates fragmented stovepipes for operators and commanders. And it actually, it ends up, what it ends up really doing is it hides the failure rather than fixing it. And we just can't afford to do that anymore.

So the strategic goal of the third part of what I'm describing on the strategy is: speed is our advantage. And this new model is the only way to achieve what we have to do with a data breakthrough and adaptability for this modern large-scale globally integrated and combined joint old domain command and control, which I'll end on that point that when Glen and I were in the building, we were haggling about this and we're still haggling about it. And we're out of the building and out of uniform.

And I guess what we're outlining here is that we really got to take some new approaches and do some breakthroughs here. And otherwise we're going to get, we're going to continue to be behind and we can't afford to do that anymore. So thanks, Riki.

I'll open to any questions.

[Riki Ellison]
Thanks, Charlie. Hey, great points. When you want to start this off, cause you got to start it and you've laid it out. It looks like it's going to start basically on those in the Ukraine or cheap center EFDL.

[Gen. (Ret.) Charlie Flynn]
Yeah.

[Riki Ellison]
What about space? I mean, I understand that part of it and I think we can get that done.

And I think we're going to have to force that to stay at the pace that Mike's doing it at the C2. But isn't this a lot about the stuff up there? How do you balance that? Or you don't have a test bed—this looks like a real test bed that you're talking about that you can do down here on the ground.

[Gen. (Ret.) Charlie Flynn]
Yeah, I mean, we can do it on the ground. But I guess all of this is going to be reliant on all the layers in space.

And so this is all going to have to be uplink, downlink and worked. But what I'm saying by "iterate at the edge," I'm saying that we have to get out of our labs. We got to get out of Nellis. We got to get out of Yuma. We got to get out of these places where we can't put those, I'll say distributed COTS, low cost attributable sensors out there to pull all this data together so we can start working on fusing that data and then testing it in our networks to make sure that we've got the right means to be able to see how these things are going to be integrated. So yes, it's absolutely reliant on space.

But it can't be solely reliant on that.

[Riki Ellison]
Okay, and then from the other side, the people that will say that this type of way with cloud—you have latency, you have latency and latency and a fire control thing doesn't help you. So that's why they have to go back to the old way.

And then also the security of the cloud and its vulnerability versus subject. I'm just wanting to throw that out there to say, that's keeping, and then obviously this looks like a software element. We're not very good at software in the building.

We're good at hardware. So this is just throwing those out there. How would you respond to that?

[Gen. (Ret.) Charlie Flynn]
A couple of responses. First of all, industry does software a hell of a lot better than the government. Although to Glen's point, we need to own it.

So, I mean, they just are better at it. So let's give it to the pros that actually do this stuff. On the cloud, I mean, I think that last time we talked to Ukrainian counter-UAS commander over there, he said, if he didn't have his stuff in the cloud and not on-prem, they'd be losing terribly.

So we have got to get all this stuff in the cloud. I would argue it's more secure there. It's a hell of a lot more secure than just on-prem or a contribution or distributed on-prem because you don't even know where it is.

Hell, we don't even know where our data is to start with. So at least if we make the effort to get it into the cloud, we can secure it and we can create the categories and tag it in a way that makes sense so that we can do what we need to do by fusing it. The data doesn't matter.

What's most important is integrating and fusing that data together so that you can actually use it in a defensive, protective, or offensive way.

[Riki Ellison]
Well, I was just saying that it's easier to contain a little fight like Ukraine. When you're talking about what Glen's talking about, the latency is going to be an issue. There's so much damn data.

So that's something I don't think the cloud's solved yet in terms of how, and that requires more power or more, but we'd like...

[Gen. (Ret.) Charlie Flynn]
Yeah, storage capacity, processing power.

[Riki Ellison]
You're saying though, you're saying to start at the very bottom, at the small, where you can manage it and build that up, right?

Is that what you're saying?

[Gen. (Ret.) Charlie Flynn]
I am saying that we have to start with not trying to fit it onto our old legacy systems. We need to get new sensors out there, low cost, attributable, pull it in, get it up in the cloud, test the health of the network, and we'll figure out what's going to work.

And that ability to be able to move that between our partners and allies and our services is, that's the first critical step in this stuff. Because if we just try to take our old legacy systems and bolt new things on, it's not going to work. And my fear is that's what we're going down right now, and industry will drag us down that highway, and then we're going to be in the rumble strips and then off the highway.

We can't do that.

[Riki Ellison]
All right, thank you. Glen, you want to add into this?

You can come on in.

[Gen. (Ret.) Glen VanHerck]
A couple of things. On the old legacy systems, while I agree with Charlie there in many aspects, those old legacy systems are going to be foundational to Golden Dome.

We're not going to develop a new GMD system. We're going to expand it to additional capacity. So it's not about bolting something onto those systems, in my mind, it's about those systems sharing their data into the cloud, what you've been calling it, or that data layer that I'm talking about.

But we do not want to have to connect to that system. We want that system to push their data so that the data can be utilized. I think that's a little bit different, a nuanced way of saying it.

Now, point defense. Charlie talked about that. I couldn't agree more.

But what are we tasked to defend? From what countries, what threats? Nobody's figured that policy out yet.

How do you build an O plan, or how do you even resource defending your homeland if you don't know exactly what you're tasked to defend? Now, some people will go, well, if it's coming from space, you defend from everything up there. Okay, that's a little bit different, but still, you want to prioritize.

You don't want to waste every BB you have on every potential threat that may not even be going after your critical infrastructure. It may be decoys to run your bullets out so that then they can finally shoot what they're going to go after. So we need to figure out what the policy is, what we're going to defend.

And I agree, it's not everything. It's unaffordable, unrealistic, and unachievable to defend and defeat everything. And when we say defend, don't use the word defend as synonymous with kinetic capabilities.

Defend may just be exquisite hardening, camouflage concealed deception. It may be a use of the electromagnetic spectrum to deceive. But we need to get out of the, hey, we've got to have $3 million SM series missiles going after $10,000 drones.

That's not where we need to be. So let me just throw a couple of other things out. We're getting ready to get into either a government shutdown and for sure, we're going to have another CR.

And this is 14 out of 15 years, I think, that we've had a CR and maybe more. And the last time our government did their job and passed all of the appropriations, I think it's 14, I can't remember how many it is, I think was in the early 90s. And before that, it was in the 70s.

Government has got to get their act together. They have got to put predictability in so that the defense industrial base, our commercial sector can move out, use their IRAD, their research and development funds. They can hire people so that we can scale when we need to.

And we need to yesterday, not tomorrow. And so our government's got to figure this out as well. And the other thing I want to say, you kind of talked about it, but modeling and simulation has got to be part of Golden Dome and everything else.

And we don't want to necessarily go down a path of put everything in a lab. But I think modeling and simulation is underutilized when it comes to force development, force design, budgetary decisions to go fast. We wait for the exquisite decisions and we wait decades to get them.

And instead of using some modeling and simulation going fast and accept a little bit of risk with an 80 or 90% solution, we'll wait 15 years to get to a 100% solution. And then it's irrelevant at times.

[Gen. (Ret.) Charlie Flynn]

I mean, I was just going to say on, just to come back to, I guess what I'm describing is our more sort of restrictive exquisite systems—so, you know, ones we have right now, right?—they're a vital part of this architecture. I don't want anybody to misunderstand that part of it.

But I don't think they're the default starting point. I think we have to go and start somewhere else and work to make sure that those systems are integrated as part of it. I guess our first priority must be able to move the data quickly—that's what I'm talking about—at scale across a mission partner environment and regions.

And only then should we focus on connecting the isolated legacy systems, because we've got to start somewhere new. That's my concern is we're going to start on the things that we already have and we'll come up with all kinds of reasons why not: “restrictive this, security that.” And my fear is that if we do that we're going to waste time. We're going to waste effort. We're going to waste energy. And we don't have that luxury. That's my fear.

[Riki Ellison]
Yeah, you're on it.

And I think that's what Europe's doing on that.

But I want to go back to... Go ahead.

[Gen. (Ret.) Glen VanHerck]
Well, just real quick. So, I'm not arguing with Charlie, but the president wants something delivered in three and a half years. Okay? We're not going to have space-based interceptors and effectors ready in three and a half years. Okay? But we do have the capability to use existing systems to be able to have a nascent capability to go after hypersonics, cruise missiles and other threats while we then continue to move forward and field in the exquisite space-based capability.

So there's a balance and a trade-off for Golden Dome specifically. I think Charlie's example applies absolutely to Ukraine and other scenarios where you need new technology. You don't want to, you know, you can field it in a timely manner, not a decade or more.

Absolutely, I agree with that. So go ahead, Riki.

[Riki Ellison]
The one thing you brought up, Glen, that OV-1, the operational architecture, it's hard for the public, I think.

This thing's been given as an executive order in February. And where is that? I mean, the public's not going to know it as much, but why hasn't that been done?

Are you assuming that has not been done yet? Because if you don't know what you're going to defend, where are you going to defend from, where are you going to go, how do you build a system around that? So it looks a little gray here, huh?

[Gen. (Ret.) Glen VanHerck]
It's been done. Okay, it's been done. So Mike Guetlein was given 60 days. That 60 days expired, I think, on the 18th of September, so last week or so. He took a briefing to the White House. They have not made that public yet.

So a lot of that work's been done. I don't know if they specified specifically policy on what to defend, but I know he took that OV-1, that architecture over there. I do believe what you're going to see is they're going to be very tight-lipped and not share much of that information.

My point would be, and I think I mentioned to you this before, this is a perfect opportunity for deception with our allies. And so if we don't have a deception plan as part of reveal and conceal and other things as we build out Golden Dome, shame on us.
[Riki Ellison]
Charlie, you want to comment on that?

[Gen. (Ret.) Charlie Flynn]
Oh, I completely agree with the latter part.

[Riki Ellison]
My last one is, because I want to just pull it back a little bit, data's data. And it's not offense or defense. It doesn't care. And it can be used, offense and defense, on this.

And that also seemed to be a pretty big driver for bringing everything in, as you said, for that overall C2 to be able to, not just defensive stuff, but if you're doing it at this level, it would have to be everything. Is that true or not true or?

[Gen. (Ret.) Glen VanHerck]
Oh, I'll go first and then Charlie can correct me.

To achieve the president's vision for defense of the homeland, a Golden Dome, to achieve what General Guillot and General Guetlein have come up with in their vision, you cannot do it without all-domain global data fused to be able to enable effectors from sensors and enable decisions through effective use of AI and LLM. It's impossible to do, and it's going to have to have that.

[Gen. (Ret.) Charlie Flynn]
Yeah, I agree.

[Riki Ellison]
Charlie?

[Gen. (Ret.) Charlie Flynn]
Integrated, and I think the large language models and AI, I would add, agentic AI over time, those things are going to be really, really important because those agents can be out, they can be working all the time when a human can't work all the time. So, that's got to be part of the early design of this in my view.

[Riki Ellison]
Thank you.

[Gen. (Ret.) Charlie Flynn]
And I guess what you're, also the part of your question, I think we're in a, like we have systems that were designed to do defense only, both sensors, radars, and launchers. Those days are, we have to, those are long gone. I mean, it has to be able to protect, it's got to be

sense, it's got to be able to share, it's also got to be able to defend, and it's got to be able to do counter fire.

And the ability to share that data, that integrated data across partner networks and across service domains in a combined force effort—that has got to be in the early designs of this thing. And I hope it is.

[Gen. (Ret.) Glen VanHerck]
So, Riki, let me give you an example about data, okay?

So, our existing radars, whether they're FAA radars, Secret Service, Capitol Police, DOD, they produce raw data. Today, what we've historically done is, that raw data is not seen by a human, it's filtered out through these filters, so you're not seeing everything. Essentially, 98% of it falls on the cutting room floor, you don't even process it.

And most of our sensors were designed for a single threat, so say a ballistic missile, but that same sensor sees aircraft, or if it's an acoustic, it probably hears submarines, it hears bombers, it hears multiple things, but that data gets dropped on the floor. And the best example I can give you, I can give you one with the balloon, but I'll give you this one. In 2015, a gyrocopter landed on the Capitol lawn.

Nobody saw that gyrocopter, it flew at treetop level and landed there, it surprised everybody. When we went and got the real raw data from all the sensors, military, FAA, Secret Service, Capitol Police, and you allowed that data to be shared and processed through the machines and artificial intelligence, you saw that gyrocopter—the problem was we weren't sharing and fusing that data, and it required no new sensors, nothing, it just required sharing of the raw data.

[Riki Ellison]
Glenn, our good friend Tom, Tom Goffus, mentioned that in the Baltics three days ago that we had, that we're gonna have 650 F-35s for NATO, and over 50% of that data is not even looked at. And so, we've got to get in this problem, and there's no way we can do it the way we're doing it with stove piping. We have to have cloud capability to at least process the stuff that we don't even, we're not even gathering, it's ridiculous.

But now just following up on that. All right, I think we're good here. I wanna open up to my class first, before I give it to JD. Anybody here would like to ask a question, come on up here, so I can see you. Do we have any?

[Gen. (Ret.) Charlie Flynn]
So we know who's doing this.

[Riki Ellison]
We're gonna, come on up, you can sit over here.

[DJ Porter]
Hi sir, I'm DJ Porter, I work at PACAF as a senior defense officer in the 613th AOC. One of the biggest problems that we have is classification. And amongst sharing that information with our allies and partners in the region, that's something that's difficult.

We can, we have information, other countries have information, but we can't share, even if we're working with two different countries, if we're doing a tri-let, they have to talk to us, and

then we disseminate the information that we can share with our partners. The concern that I have is, even if we do build an unclass method of maybe mesh system of information gathering and sharing, will our partners that we are putting our sensors on allow us to see that information? It's unclass, but with that, we can also see what they have, and they don't wanna share that. So do you see a way forward with classification and that ability to share information?

[Gen. (Ret.) Glen VanHerck]
If you don't care, Charlie, I'll take a stab at this. This is a cultural problem we've been talking about for my now almost 40 years since I was commissioned. So here's the bottom line:

This problem has been solved. National Security Agency allows allies and partners to work with them, and your credentials allow you to access only the data that you're cleared for. This is not a problem.

It's a matter of what we wanna clear folks for, and this has been a problem. We tend to stovepipe. We tend to have laws and policy that doesn't allow us to share.

So when I go back to my original comments, our allies and partners bring domain awareness. They bring authorities and capabilities. We've gotta get comfortable, but there are some things we can't share, and they know that, and there's some things they won't share with us.

But to answer your question, it's not a problem. We can do this, and sharing data into a cloud or the data layer actually enables us to ensure the right people get the right data at the classification level. Charlie, you?

[Gen. (Ret.) Charlie Flynn]
Yeah, I was just, I think, again, when I mentioned open standards for allies and partners to contribute, and then maybe this is a bit controversial, but I guess what I'm saying is if we can prioritize moving the data and understand the health of the network to our partners, then we can go back. That can be before trying to connect the old and isolated systems right now that we have. We have agreements in place like Glenn is describing.

So let's use the agreements that we have in place, have open standards, share the data, test the health of the network through their sensors, our sensors, et cetera, integrate it, get it up in a cloud, because we share a cloud, and then go and look at the, I'm going to say, old legacy systems that we have right now and figure out, well, how do we protect what we have right now with systems and data and exquisite capabilities that are part of those systems? I just think, DJ, we have to think about this differently. And so I guess I'm kind of reversing how we look at it.

Thanks for the question, though.

[DJ Porter]
Copy. All right, that's all I got. Thanks.

[Matt Lyons]
Hello, gentlemen. General Van Hurk, this question is for you. Matt Lyons, Special Operators Command Pacific AFA 40, Army Space Operator, working FOO Ops for flexible options right now and O-Plan Riding and whatever else.

So, sir, you mentioned that some of the obstacles we're having are culture, policy, and law right now. I kind of see solutions for culture largely being leadership. I see leadership can influence culture in so many ways and kind of a driver, driving change.

A policy I've seen a lot is not only leadership, but sometimes we'd call it policy by CONOP, where we come up with the ideas and we just force it and push it and make it real. So then someone says, okay, yeah, this is what we're going to do, and this is the approach we're going to take. But then on the law side, what are some of the solutions you might have, sir, just ideas between you and General Flynn and Mr. J.D. for that problem?

[Gen. (Ret.) Glen VanHerck]
Well, it starts out with being able to articulate what you can or can't do based on the law that you may be tasked to do in a policy and what the risk of not being able to do that because of the law might be that forces a broader discussion.

So let me give you an example: I was in command when the Langley drone incident happened. We didn't own that, that was the service, but I was trying to help the service and I asked for passive collection capability to be able to further characterize the threat, the operator location and the threat. But the law prevents DOD Title 10 from collecting intelligence and information in the homeland. And so I've been saying for a while, we need to go reassess the current law to ensure we're not putting ourselves in a national security disadvantage.

And if you wanna leave it like it is, that's fine. Just you now have inherited the risk of doing that. That's what I would say is a good starting point. And that applies to policy and it applies to culture as well. We as leaders must be able to articulate, not in a military jargon level, but I say to an eighth grade level, to a human walking the street, what is the risk you're inheriting by whatever policy, culture, law thing you're talking about? Charlie, do you have anything?

[Gen. (Ret.) Charlie Flynn]
I think that's a great example. I would just use the example of we guard our gates. We have rules of engagement. We can apply lethal and non-lethal effects against a threat that is coming at us. Yet we can't protect the airspace over our own installations. We have to go literally go ask for law changes and policy changes from the FAA just to fly UAVs inside of our own, I'll say federal property and airspace to be able to do training.

I mean, it's crazy. And so Glenn's point is a really good one. And I think that those are the kinds of regulations that are injected upon us by way of laws that have to go back and be changed. And then we can get people's headspace in a different place. Those threats are just changing so rapidly, we can't afford to sit back. That's a good question though.

[Matt Lyons]
Thank you.

[Riki Ellison]
All right, we got one more. One more and then we'll pass it over to J.D.

[Justin Cunningham]
Morning, gentlemen. Justin Cunningham. I'm at U.S. Space Force in the Pacific here at Joint Base Pearl Harbor Hickam. Deputy Chief of Staff doing and managing everything associated to that. Background for at least context for this is I did layer two, layer three service networks

at the National Constance Office. And then under General Gutlein was also doing the same implications for ground-based implementations for space operation centers to fuse that data. And in so doing, I love hearing the positivity and the right things coming from senior leaders like yourselves.

Ultimately, everything you're saying are things at the AO level we were driving to solve. Two things I do want to give some good news for, as far as space capabilities were concerned, we did align to two application protocol indexes. One was a GEMSAT compliant, which is a NASA-based construct.

So all the applications and networks connect appropriately. The other one was, to Riki's point, was a consortium of existing contractors that worked together to build an API. So when you did build something, you didn't have a stovepipe implementation.

So that's been something that's been progressing in space since about 2016 timeframe. The problem herein lies as we start to work through that, and you hit the nail on the head, sir, is the data ownership. It is expensive.

And then when you tell somebody, hey, I need to buy the data rights, and you see the dollar figure at the back end of it, that's when senior leaders go like, well, okay, then how do we manage these things? How do we do the monitor maintenance functions? Those are issues that we're still going through that we definitely need policy and culture alignment for.

It's been quite painful. And then I would add to the other concepts that there are personality issues where individuals go, "I want to build this new whiz-bang thing", and then don't really talk in the concepts. And we have constructs of that within the space domain as well.

But the breakdown here is, across all of these things, the fact that we are trying to be more integrated in the joint force construct and being the smallest service at this point in time, where did you see the biggest issues with both the current concepts that we have for the old exquisite systems and the perception of moving forward about space integration? Because we are leaning forward as best as possible, but even getting invited into the room sometimes is a problem. What are your thoughts on making us more integrated?

[Gen. (Ret.) Glen VanHerck]
You want to go first? You want me to go, Charlie?

[Gen. (Ret.) Charlie Flynn]
Go ahead, Glenn.

[Gen. (Ret.) Glen VanHerck]
So a couple of thoughts there. Yeah, I agree with you. We have to educate folks. You know, General Chilton, one of your great astronaut space minds, once told me, "Their ignorance is your fault". And what he meant by that is, I need to go educate folks on what space brings to the capability. You can't be an afterthought.

Everything that we do today relies on space, for the most part. So you have to be part of the discussion as well. With that said, I think you hamstring yourself with over-classification, lack of sharing of technology and capabilities when you do get in the room.

And so if you come in the room and you're invited in and you say, well, we can't talk about that, well, they don't want to invite you back. And so there's a middle ground here where we have to all work together to educate and also to be able to share data and information so folks think about that space capability. But if they never know about it in the first place, how do they know to even ask for it?

Anybody who sets up a command and control organization, a joint task force or whatever, should have a space officer, a liaison, at least in that organization, irrelevant of what the mission is. If there's not one there that can be able to articulate space and space requirements and reach back for space capabilities, then we're failing ourselves. Yeah.

[Justin Cunningham]
Sir, I'm gonna quote you on that and just heads up.

[Gen. (Ret.) Charlie Flynn]
I think the service concepts and the joint concept, the war fighting concept, I think we need to double down on that a little bit now. I mean, things have changed so, so much.

Shit, since the days that Glenn and I were, again, in the building working on this kind of stuff, but I'm not sure it ever really matured to the point where there was broad agreement on what it was. And I think the services have concepts, but we gotta do a better job of pulling in and teaming up on a joint war fighting concept.

Don't go too far out. You can't go to 2045, you can't see that far, but you need something that gives all of the domains, the joint force and factors in the weight of what is gonna happen in space and what will happen in space. And we just, I think we need to put some more elbow grease into that work. And I would, I mean, I'm making the point to the people that I talked to about it, because I just think we need one badly.

[Justin Cunningham]
Yes, sir. I will say INDOPACOM to put several space officers up at Camp Smith. One of them actually is with us right now. He works on the J362 as well as part of this consortium. Thanks gentlemen. Thank you.

[Riki Ellison]
Any other, we're good? Okay. All right.

That's awesome having the class ask those questions. This is great. JD, we're gonna have JD, you can say a few words, JD, before we start and then take the questions from outside the class here. JD?

[JD Gainey]
Yeah, so thank you for that.

There's really only one question that's come up that you gentlemen have not answered already. And it's in the context of JADC2, the fight against culture with the legacy systems, the legacy, almost insistence to keep carrying that forward. The analogy was, you know,

when are we gonna stop using the Yellow Pages and Rand McNally maps to be able to get where we're going?

So understand that the JADC2 is going to somehow take effect in some form. This cloud-based discussion we're holding right now, where do you see a potential end state? Like for advanced technology, advanced techniques.

So why are we so insistent that this is where we need to go? Cloud-based compute, support, you know, data distribution. What other venues or avenues is that gonna lead us that we need to start accepting using, utilizing the cloud, current technology, digital engineering, and so forth?

[Gen. (Ret.) Charlie Flynn]
I mean, I would just say that I think the, look, everybody's working to get more in the cloud, but, you know, just organizing your data is incredibly hard. I mean, you know, we, I'll go back to my 3-5-7 days, I was in charge of ops data. The G2 was in charge of Intel data, but there's business and administrative data.

There's four types of data every service has. We were not in charge of the business and admin data, but you actually, in order to know where the people are and to understand where like all your facilities are, like all this stuff, JD, is it's really, it sounds easy, it's very difficult. I guess what I'm saying is we have to get organized with our data and get it off-prem and get more in the cloud, organize it, and then make sure that we can separate that data that we need to fight with so we can clean it up, we can tag it, and we can have it prepared to be integrated across each of the services.

I don't really know how to say it any more, like simpler than that, but I just think we need to move. Now, one thing I mentioned earlier, we need storage capacity and we need processing power. We need industry's help with that.

There's no way we're going to have that processing power and storage capacity unless we get help from industry. So, and yes, it is costly, but it's cheaper than not having it when you need it. Over.

[Gen. (Ret.) Glen VanHerck]
Let me pile on. So I'm a firm believer, JD, that he or she with the right information, the right data, wins in the future, whether that's day-to-day campaigning, and they get that data in front of their potential adversary, whether that's day-to-day campaigning, crisis, or conflict. I found as a combatant commander, the only thing I could never give the President and the Secretary enough of was time and decision space.

And the only way you create more time and decision space is you take data that's available, you process that data, and you disseminate that data in a more timely manner than we do today. So I can give you an example. So for example, every time North Korea launched a ballistic missile, I would ask the question, did we have awareness of that missile launch before it launched?

And almost always the answer was yes, but, the data wasn't downloaded off the satellite, or the data wasn't processed by a human. The only way you get that data faster is you process it using AI and ML on a satellite and disseminate it immediately and have it go to the right decision makers to gain time and decision space. I can give you another example.

So I was standing on the ground at Fort Bliss, Texas, my Army buddies based down there, one of them, when the first airplane with Afghans landed on the ramp. They got off the airplane with 11 1⁄2 by 17 legal sheets, the yellow legal sheets with all of their info. That was their data when they handed it to people.

I said, we got to do better than this. So what I found during this journey was that DOD systems didn't talk to DHS systems, that didn't talk to Department of State systems, that didn't talk to Department of Transportation. I'm like, we got to do better.

We needed input on one end so that it's input and spreads across every entity one time so wherever they go, we have that data. And in a matter of about six weeks, we were able to take that data, input forward in Afghanistan, populate every system across the government so when they landed, we had the info. So that's kind of the need to go.

You can do more with less, but that's not a manual process. I tell people we can do more with less if we utilize data, software, computer capabilities to do it. Thank you.

[Riki Ellison]
JD, feel free to ask questions.

[JD Gainey]
No, that's fantastic, yeah. No, that's it, I'll just like tee off with my final comments are, in order to speed the decision-making process, there's things that the commercial world are using and pursuing that we're going to have to start adopting.

General Flynn, you mentioned quantum compute, the quantum reckoning, using it for security of data moving around. So in order to be able to facilitate that advanced future stuff, we got to get the fundamentals right. And the new blocking and tackling in today's day and age is you got to trust the data and the data accessibility.

That's all I had. This was a good one, I appreciate being a part of it.

[Gen. (Ret.) Glen VanHerck]
Let me add one thing, Riki.

Yeah. Okay, our IT infrastructure is foundational for where we're going. And our IT infrastructure has lived on end of year fiscal plus ups. It has not been budgeted for as a weapons system. We have got to get beyond that and fund it or else we're going to find ourselves in trouble.

[Riki Ellison]
Okay, we ran a little bit over time, we're all good. But Charlie, let's go around for final comments and we'll close it. This has been a great discussion.

[Gen. (Ret.) Charles Flynn]
I'm good, thank you so much. Thank you so much for the invite. I appreciate being here. All good.

[Gen. (Ret.) Glen VanHerck]
Riki, I'm good too. It's great to see Charlie, JD. I can't thank your alliance for what you do enough. You're really important.

[Riki Ellison]
Thank you, thank you, Glenn. I think this was a great, great discussion for the general public to clearly understand how big the problem is and really what we have in solutions to be able to fix that problem. And it's going to take resolve. It's going to take energy. It's going to take everything we got to get where all of us want to be in three years with Mike Guetlein and the Golden Dome.

But greatly appreciate the class that was here. Okay, aloha from Hawaii. Thank you.

[Gen. (Ret.) Charlie Flynn]
Thanks, have a great weekend, everyone.