



Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Okay. Good morning everyone. Good morning. It is, wow. What an amazing audience we have here with us today. We are so excited to talk to you about this fascinating topic, Artificial Intelligence: The Backbone of the DAF Battle Network. I'm Major General Kim Crider and it is my absolute pleasure to be moderating this panel of experts here today. Let me just start with a couple of opening remarks. I will introduce my panel members and they will then briefly introduce themselves, give you a little bit of their thoughts as we get this thing started. So you know that the Department of the Air Force has identified the DAF Battle Network, a set of some 50 programs that span multiple offices and agencies across the Air Force and Space Force to comprise the Department of the Air Force contribution to JADC2 and to meet the SECAF's Operational Imperative for an operationally focused ABMS.

This DAF Battle Network is the next evolution of the advanced battle management system, a network of systems and capabilities connecting sensors to shooters, across multiple domains around the world with command, control, communications and battle management that outpaces the threat and delivers operational outcomes at the speed of need. Today we're going to explore how artificial intelligence acts as a foundational component of this DAF Battle Network. Where it shows up, how it creates advantages, where there are risk, and how the risk of AI employment across the battle network should be mitigated to maximize operational effectiveness. So let me introduce our panel members, and I'll just say their names for you here and then I'm going to let them briefly say a few words themselves. So first we're going to introduce Mr. Ian Eishen. Ian is the Director of the Global Public Sector, Aalyria Technologies. Ian?

Ian Eishen:

Thank you General K Crider. Good to go. Okay, thank you ma'am. Ian Eishen, I'm the Director of Global Public Sector at Aalyria. Our focus is taking disparate aircraft vessels, ground stations, and then satellites in various orbital regimes and connecting them together in a self-healing mesh network. And in fact, we announced today we're doing the same thing by partnering with Intel SAT for a holy optical network at hundreds of gigabits a second. And when you look at moving pieces and your network is not simply these pieces that are consistently in the same place on the ground when they start moving, when every change in their orbit actually changes the type of connections they can make, it's really difficult to make any of that happen without advanced to AI/ML.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Thank you, Ian. Yeah, we're really looking forward to hearing more about this fascinating set of technologies as we get into our conversations today. Next we have Sean Moriarty, chief Executive Officer, PrimerAI.

Sean Moriarty:

Thanks so much, general. It's truly a privilege to be here. At Primer we build software tools so leaders, operators, and analysts can make better sense of the world around them. Our whole focus is to provide the tools and the information so that we can make more informed decisions so you all can make more informed decisions. We leverage natural language processing and AI, but we do it in a way that gives you the confidence and the information that's being presented to you. As we all know, we live in a world of a rising tide of misinformation and disinformation, and our lens is one of practical AI. And we judge our success on the basis of the ability for the user to do their jobs better than they could before. Again, very happy to be here today and join all of you in the conversation.



Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Thanks so much and I know we're going to have some really great questions today that'll allow us to unpack a little bit more about this idea of practical AI and the ability for users to make better decisions and do their job. Thanks for being here, Sean. Next we have Dr. Lynne Graves, the Chief Artificial Intelligence Division, Chief Digital and Artificial Intelligence Office. Dr. Graves?

Dr. Lynne Graves:

Good morning and thank you General Crider. I am the chief of the Artificial Intelligence Division. This is a new division in the DAF CDAO office. We're engaged in the O policy guidance and oversight of AI capabilities for the DAF. We have a role internally in terms of partnering with everyone across the DAF, but we also have a role externally up to the OSD CDAO and then also with our partners in industry and academia. Thank you.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Thank you so much. Really important office that was set up. I think we're probably one of the only services that have such a focus with the chief of artificial intelligence division within that CDAO. So thank you so much Dr. Graves. We're looking forward to your thoughts on how we can really adopt AI within our Air Force and Space Force. And last but not least, my very good friend, Major General John Olson, who is the Mobilization assistant to this Chief of Space Operations and the Space Force lead for CJADC2, Coalition JADC2 and ABMS.

Maj. Gen. John M. Olson:

Hey, good morning everyone. It's really a pleasure and honor to be here. This is the AI panel for AFA. And so I think that's really critically important. As we look at this, President Xi Jinping has laid out leading the world in AI by 2030. We in the Department of the Air Force have laid out being AI ready by 2025 and AI competitive or leading by AI 2027. So it is truly a pleasure and honor to be here and talk. And I have a couple of slides if we can queue those up that really General Crider and I are looking to set the scene for this awesome panel. Okay, back up one. When we look at it simply put, space plus data and AI are going to enable our dominance in the 21st century. And as we just heard from the Chief of Space Operations General Saltzman in the previous keynote, we absolutely are competing to win. Our theory of success is competitive endurance in the 21st century.

So as we look at our new mission statements, Guardians secure our nation's interest in, from and to space. And we do that by fielding combat capable of ready Airmen and Guardians. We also amplify the Guardian spirit and we drive and partner to win. And this is industry, academia, the interagency, the international and academia across the board. So this is vitally important part of our overall mission accomplishment. But when we look at it is a congested and a contested domain already hundreds of satellites by our adversaries with both kinetic and non-kinetic capabilities as well as ground-based capabilities. This is the challenge that we face in the environment within which we must operate and think about AI, ML and DL. And so as we look at this, this is really a call to action and we need to focus on three primary things. We need to go back to the basics, the three Rs. Responsible AI, because our Secretary of Defense says, we will be responsible with our AI use or we won't do it at all.

And we've named our Chief Responsible AI Ethics Officer on day two of the standup of the first Chief Data and AI office last year, and that's Lieutenant Colonel Joe Choppy, he's in the hall. Go ahead and stand up Joe so people can see you. That's absolutely critical. The second part is just like that resilient architecture, a space order of battle that is resilient. So we need resilient AI. And finally, in an adversarial environment we need robust AI. So those responsible, resilient, robust AI underpin



everything that we're doing. And so as we look at that, what is it all about? It's not data generation or AI applications for their own sake. It's to drive decision advantage and to do so at the speed of need. And as we look at that data and AI are strategic imperatives. As we look at our combatant commands, 10 of the 11 have data in their top three of their integrated priorities list. And the 11th hazard is number four. All of them, or pardon me, 33% of those have data as number one.

So this is truly a critical enabler for us. And then also we have a rigorous focus as General Crider mentioned, 55 plus programs, 21 and a half billion dollars. We're focused on fielding the DAF data, or pardon me, the DAF Battle Network. In the very front of the room we have Brigadier General Luke Cropsey, who is the leader for our C3BM activity that is developing from an acquisition and an architecture and systems engineering sense, the capability set. And then of course I lead for the space operations side and along with my partner and the lead of our advanced battle management systems cross-functional team, that's Brigadier General Flack Clayton. So together, this is really how we're getting after this systems to systems challenge, all underpinned by machine to machine speed of sense, the ability to make sense and act all at the speed of need in an adversarial environment.

It's driving and enabling our seven operational imperatives for the Department of the Air Force. And really when we look at that, how are we getting after and applying it's through a campaign approach, a deliberate and rigorous campaign approach focused on outcomes and winning with that theory of success of competitive endurance. So with that over to you.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Thank you so much John Olson. All right, so let's unpack that a little bit and thanks again for teeing that up for us and setting the stage for us, General Olson for this group. I want to unpack a little bit given your background in space in particular to help us think through and understand how do specifically space capabilities factor into this staff battle network and what role does AI play, is AI playing today in maximizing the effectiveness of those space capabilities to achieve the operational effectiveness that we need?

Maj. Gen. John M. Olson:

Well, I'll quote Secretary Kendall. "The answer to China, China, China is space, space, space." Because when we look at the tyranny of distance, when we look at the supporting and supported capabilities that space affords the joint warfighter and our coalition partners and allies, it is absolutely critical to everything as we do. As we look at those seven operational imperatives. The first is first for a reason, it's a resilient space order of battle. And when we look at that, the second is operational imperative two, that's operationally optimized CJADC2, ABMS, and C3BM. For an OV1 or an SV1 or systems template. That is what we put all and collapse and integrate all the other OIs on. And the third is moving target indicators and capabilities. When we look at those first three OIs are very, very space centric and so there's huge enabling elements of space. But when we look at what space affords and you said within the context of the DAF battle network, it's absolutely if we look at missile warning, missile track, we look at precision navigation and timing as we look at communications and space data transport.

As we look at NNTI, as we look at weapons and targeting as we look at battle damage assessment, as we look at weather. All these and so much very more in the way of our mission capabilities that enable the joint force and our coalition partners and allies, this across the spectrum of conflict in competition crisis and conflict is what is at the core. And so when we look at the DAF Battle Network, that's why we're using a model-based systems engineering approach. But when we look at the challenges before us with a near peer adversary or a near peer challenger or competitor in this great power competition, one thing is clear, machine to machine speed in doing so at the speed of relevance in a highly contested



degraded environment is going to be paramount. So data and AI underpin that. Whether it's from the aerial networks and the edge nodes all the way to the central core. We need resilience, robustness, and responsible AI throughout.

So that's really how we're looking at that and as we drive the model-based systems engineering approach to drive our requirements that in turn feed General Cropsey and Dr. Bryan Tipton's great work across at least five major PEOs under that ages, this is how we're going to tackle the systems of systems challenge. It is dealing with legacy systems all the way to the bleeding edge, cutting edge, new capabilities that we're fielding as what we call part of our future, our motto chart. These are the things that we're doing to build that resilient and effective space architecture that will in turn deliver the effects and the outcomes that we need for the joint warfighter.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

That's great. Thank you so much. So space is absolutely a critical piece of the DAF Battle Network. We thank you for helping us think through how AI is a big piece of that model-based systems engineering to help us think through and envision how space can be employed as part of that, and really in support of all of these domains of operation that have to come together in a very coordinated way to enhance the joint fight. I'm going to come back over here to Ian. Ian Eishen, given where you sit, where do you see AI playing into this multi-domain battle network?

Ian Eishen:

Yeah, I think especially with what the general was just talking about, he talked a lot about AI as this big thing. But I think for all the Guardians and the Airmen in this room who are writing down notes to figure out, "Okay, I want to get into this. What do I do? What do I start with?" You look at the sensors that he's talking about and whether that's MTI sensors or some sort of electro-optical or IR sensor that's going to be convolutional neural networks. And so looking up CNNs, looking up object detection, figuring out how artificial intelligence algorithms can actually look and make sense of images is kind of the beginning of that based on those types of sensors. You also start looking at different signals and electronic intelligence sensors and they can use those object detection algorithms or they can also use some other versions of spectral algorithms that allow them to make sense of it. And so if you're looking this up and you're trying to do some research, I think I'd start with those.

As you start looking at each one of those space assets, it's just another node on the graph for the DAF Battle Network. Half the network is going to be on the ground, it's going to be at Beal Air Force base, it's going to be at the Pentagon, it's going to be at all these positions and locations that we already know of. At some point though, one of those nodes is going to be a KC-46 with a comms package. And every time it moves, when it rotates, that line of side antenna now is opened up to an entirely new network that it wasn't 10 seconds ago. And as it turns again, the entire list of compatible receivers changes. That is something that I can't do. That's something that we can't do within our radio room as we start to plan things out three days ahead of time with an ATO. And so that's where we have to start looking at graph neural networks. How do we take each one of those nodes on the graph, move them around in time and space, start looking at predictive analytics because each one of those nodes changes based on with, whether you're using Link 16, Ka, V band, E band, it really doesn't matter.

But each one has its own propagation loss models and issues with different weather in the area. So instead of that KC-46 making the decision itself, how do we have one orchestrator or multiple orchestrators that can make those decisions as the general said at machine speed. So we do it with priority and knowledge of the rest of the network. If all of a sudden an NC-3 asset is up in the air, how does that get priority? If we're down range in a tick, a troops in contact situation or a CSAR situation



happens, how do those become the priority and all of our assets, just like we would with fires, strike, ISR, rely and move to that network, how do we do the same thing with our transport layer, our comm path? And there's just no way anybody in this room can do it on their own, especially when you start taking all these nodes and looking at them at a high level and then putting all those rules in place. And so artificial intelligence specifically graph neural networks in that case is going to be key to making that happen.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Wow. Wow. That's a lot of stuff. That's a lot of stuff. I don't know if we all really captured what was just said here, but can blow your mind when you really think about what this technology is able to do for us. You think about what Ian just said, this whole idea of being able to use artificial intelligence to number one, enhance sensing, accelerate and advance and expand the ability to sense and the ability to process all of that data coming in from all those sensors so that you can optimize what it is that you're looking for, right? And in looking for that needle in the haystack if you will, in certain cases. The ability to optimize all of the nodes in the network to be able to get the communications or the service, whatever that service may be, ISR communications kinds of PNT available to the users when and where they need it across multiple domains. And the ability to ensure that none of those connections are ever dropped. And then the ability in all of that to prioritize what assets you're going to have available to who needs it. That's pretty phenomenal.

And we're not there yet today where we fully want to be, but this technology is advancing so fast that we are really close. We are really close to our ability to make this happen. And the DAF Battle Network, this number of programs that we have coming together under this portfolio is really what's going to be able to help us do this. This raises a really interesting question though, and a concern that I think we all have, which is, well if we're doing all of this and we've got machine to machine connectivity, we've got automated systems that are collecting data, we've got a lot of artificial intelligence algorithms that are processing that data and are developing insights and information and are going to present that information to warfighters at every level of operations, tactical, operational, strategic. How do we trust that? How do we trust that, Dr. Graves?

Last year, the Secretary of Defense signed a DOD Responsible AI Strategy and Implementation Pathway. And a key tenant within that pathway and the responsible AI strategy component of it is warfighter trust. So what is the government and industry going to do together to promote the design, delivery and implementation of responsible AI across this DAF Battle Network and reinforce warfighter trust in the systems and capabilities needed to support JADC2?

Dr. Lynne Graves:

Thank you. I think it's very important to note that the focus is on warfighter here. We have a tendency to talk about the technology, but when we're talking about responsible AI, the second tenant is warfighter trust. All the other tenants are very general conceptual, come up with your process, come up with your procedures. But when they enunciated for us warfighter trust, they were very, very specific. They called out a test evaluation verification and validation framework, and they wanted to see in that we had real time monitoring, that we had algorithmic confidence metrics and that we incorporated user feedback. None of the other tenants are that specific and none of the other tenants are so warfighter focused. And that's very important when you're looking for trusted and trustworthy systems. And so I think what it is telling us is the ultimate recognition that the warfighter is the ultimate tester here.

As we're going out to the edge, as they've talked about with our different sensors and our different capabilities of things such as ABMS and the Defense Battle Network, we have to realize that it's the



warfighter out on the edge who is going to be the ultimate tester. When you think of tests, you usually think of function evaluation, taking those data points to evaluate risk, verification. Did we build the right thing, validation? Is it the right thing? So did we build it right? And then is it the right thing? Well, ultimately as we're dealing with AI, we're going to be dealing with domain shift. We're going to be dealing with unintended bias, unintended consequences. And we're going to have to be trusting the warfighter to be able to give us that real-time monitoring and that feedback. And because we need to be doing it at the speed of relevance, it's not going to be that traditional gather the data points, feed it back, push the fix back to the warfighter.

So we're going to have to trust the warfighter and the warfighter is going to be trusting the system under this tenant. We're looking for visibility, traceability, and explainability, but most of all, we're actually trusting our warfighter to let us know what we're doing when we go to warfighter trust. Now what the government and industry can do here is recognize that we're not talking simply about traditional test, the design and the development. We're going beyond that. We're going beyond deployment and implementation out to the edge. And at the edge our warfighter is going to be our continuous tester. And by doing that, by getting government and industry to buy into this new way of looking at tests and adopting this TEVV framework, which we are putting forth underneath the tenant, I think then we will be able to move artificial intelligence and the warfighter who is using and trusting artificial intelligence to this new approach to the DAF Battle Network. Thank you.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Fascinating. Let me let John Olson respond to that and then we'll switch back over here to you, Eishen.

Maj. Gen. John M. Olson:

I think you nailed it, Dr. Graves. I would just like to say as a warfighter representative up here, people are still absolutely at the core. And when we talk about human machine integration, human machine teaming, whether that be for collaborative combat aircraft, whether that be for rendezvous and proximity operations with sustained maneuver, when we talk about in space, when we talk about all these various elements that remains at the forefront and you nailed it. That ties in when you talk to people, you got to talk about training and tactics techniques and procedures development, and continuous evolution and improvement there. While being responsive to a very fluid and dynamic and fast-paced battle space environment. So I think that's absolutely right. We're going to continue to see that. That's why you've heard the words operational test and training infrastructure. OTTI is absolutely fundamental, whether it be our fifth and sixth gen fighters and bombers and all the families of systems that go with them, to all the systems and systems integration, to the space systems, to our coalition and joint partners. This is critical.

Same thing for the space side. The space test and training range is just another instantiation of OTTI that is critically important. So it's all about the people and it's about bringing the people and the machines and the technology together because at the end of the day, it's probably not going to be the human in the loop anymore. It's going to be human on the loop, driving responsible AI and doing so at a rate and pace that's simply is mind-blowing.

Ian Eishen:

So I just wanted to again break that part down into what can you actually do as an Airman and a Guardian in this room? First off, developmental tests and operational tests are key things that everybody is using. It is the way that the DOD and it's really the way that everybody goes through the process to validate certain assumptions and test hypotheses. And so it's something that everybody can



learn, that information is out there. When we start looking at automating processes and human in the loop and human on the loop, these are all processes that right now Airmen and Guardians do themselves. They've done for a long time. There's a long process where a commander has to go through an approval process and they get tons of training and experience before they can press the button or say yes or say no. Those are cultural things and those are things that are not easy to automate even if technologically we can. And so attacking the culture through people is a huge piece of this.

Technologically most of the things we're talking about we can do right now, but the culture is not ready for us to go that way. And the only way we get to trust is if we start with understanding. And the only way we get to understanding is if we start with education. And so the earlier we can educate Airmen and Guardians on these functions, what AI as this big umbrella term does and what are the specific pieces that they're going to do so they know what to look out for, they know what false positives are and false negatives and some of the issues they're going to be doing and how that training process works. The closer they're going to get to understand what's going right and what's going wrong, the closer they can start thinking through how are they going to use this in an operational use case and where is the AI good and where are they going to have to do it on their own?

And only then can they start to actually transition because man in the loop is the way that we do it. Now at a certain point they're going to have to step back and allow a machine to make a decision that they could then get in trouble for. Who gets in trouble, how do they do it, what are the legal ramifications? And so those are all cultural processes that we have to work through at various leadership levels why we're also working through the technology.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Sean, did you want to comment on that?

Sean Moriarty:

Yeah. Having spent the bulk of my career in the private sector, building technology and bringing it to customers often who are both reluctant and concerned and there's a lot they don't understand. I'd submit that the biggest concern I have right now is as important as resilience is, as important as responsible AI is, I have much more confidence in our ability to engineer those things in than I do for us to move as quickly as we need to move in this world. The single greatest challenge is not the technology is that there are things we can do today that would radically change and improve our capabilities. How do we actually get those tools in the hands of the user as quickly as we possibly can in a world where we have a very high bar with respect to responsible AI, with respect to resilience? And the other thing is when you try to engineer in first principles from the outside in, it's really, really difficult. Because where the rubber meets the road is that end user.

And what I would ask everybody in this room is to look at when you hear the acronym AI, actually change that to tools you can trust as you frame whether or not a technology is going to be able to help you out. And if we start to do that and then we look at applications where we say we have a high degree of confidence that these tools that we can trust will help us do our jobs better, and we get the reps in implementing in lower stakes environment, we will improve cycle time dramatically. But if we sit in an abstract world talking about system design principles independent of getting the reps of bringing software to the customer who's doing the job, we will lose an awful lot of time. And the conversation five years from now will be very similar to the conversation that we're having today. Today. It's okay because we're at the beginning of something. Five years from now, it should be a step change in the way we have implemented solutions that allow the people in this room to be much more effective in their jobs.



Maj. Gen. John M. Olson:

Amen.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Well said. Well said. Yeah, I really love that. Tools we can trust. Take out the term AI, which can be very abstract to some people and just replace it with tools we can trust. And this whole idea, and I think all of you have really said this in response to this one question, is this whole idea of getting the capability into the hands of the warfighters as quickly as possible. Recognizing that industry will certainly play its part in designing in and building in the appropriate levels of test and evaluation, but the goal being let's in that design phase, but let's get the capability, the MVP, the software, the tools into the hands of the warfighter so that they can actually start to use it and interact with it, and provide feedback so that it can then continuously advance and improve, and continuously contribute to the mission. Modern software delivery, iterative development, get that capability into the hands of the people that need to use it so that they can provide the feedback.

And that's the way that we're going to be able to advance this capability so that we can win the battles that we need to win and stay ahead of that threat. All right, Sean, I want to key back in with you and I am going to give you this little scenario. Take us a little back in history here. So in the late 2000s, some of you here in the audience will recall that our Air Force ISR units were drowning in imagery data collected by RPAs as that innovation was really beginning to take off. The large growth in data collection nearly melted the ped process through saturation and I bet you we've got some intel officers here that can attest to that. A similar risk could exist in the near future given the number of potential data collecting platforms.

We heard about how AI is supporting our ability to rapidly collect data in this whole multi-domain CJAD2 construct. How can AI help here? And what requirements would you like to see to ensure solutions can best be designed to match the anticipated data surge in order to best support complex all domain C3 VM needs in a highly contested and congested environment? We'll start with you Sean, and then we'll see if the other panelists want to jump in.

Sean Moriarty:

That's a great question. I think one that is often overlooked, particularly as new technology emerges drowning in data, I guess in a different context I'd say we're all going to need to buy bigger boats because the data is only going to continually, exponentially increase. And I think you have to, I always think about this through the lens of the preconditions or the environmental requirements, or you could even call it broadly speaking infrastructure. So without data, you don't have AI to sell or to keep, right? And so the question is do we have the infrastructure where we can take all of the data sources that are necessary to develop that operating picture we need? Can we actually rationalize it? Can we analyze it and can we bring it forth so that someone can make an informed decision on that basis? One of the things that I do think we're missing in this world is the ability to assess data requirements over longer time horizons.

So for example, you may look and say, "Well, here's how we've scoped this particular solution. Have you looked at the rate of data accumulation over time? Have you fully budgeted for the compute resource that you're actually going to need in order to operate on that data? Do you have the feeds and speeds and interconnects in place so that you can actually do this analysis?" So the tools are becoming increasingly robust where you can take disparate data sources from end number of locations, structured, unstructured, semi-structured and rationalize it, but it all assumes that you have the infrastructure in place. And from a practical standpoint, you actually have the budget that allows you





the computational resource you need to make sense of it. And I think having a basic framework to think about data over time against a particular mission set where you have a three to five year time horizon, where along the way you should get advantage in newer technologies that allow you to go even further, right?

Take advantage of the technology curve, but give yourself enough window of time so that you don't overrun your capacity in your first 12 to 18 months.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Thank you. Yeah, couldn't agree with you more. Absolutely have to get our arms around that data. And this idea of data over time I think is really interesting. I agree with you. We don't think about that. We don't have the framework for that and having that data over time, what are our data needs today? What do we think they're going to be in the future? How do we predict that? Can we use AI to help us predict what the data needs are going to be in the future, and then be able to plan for that so that we can tune our capabilities again with our warfighters to be able to optimize that? John Olson, what are your thoughts on this? You were the chief data and AI officer for a period of time.

Maj. Gen. John M. Olson:

Well, I think Sean absolutely nailed it. 80 to 85% of AI/ML/DL readiness is data wrangling and munging. And when we look at the incredible exponential or geometric growth in data as we have ubiquitous sensors and as we pull in all those across legacy systems to the very most modern systems across the joint services in the coalition, this is the challenge before us. So when we start talking about formatting and when we start talking about cleansing and all the provenance and integrity validation that we need to know so that we can trust that data to in turn run the algorithmic magic of AI/ML/DL and drive towards that decision advantage. This is really the critical work. And as we look at that, certainly when General Cropsey and the team driving as the integrated C3BM PEO, when we look at this, we're looking at software-defined networks, we're looking at edge compute and capability, leveraging the incredible explosive growth in graphics processing units and the compute power. We're looking to do that in space on the air, on the ground.

We're looking to leverage multi-path. We're looking to leverage a cloud capability all the way up through multiple levels of security through IL6. And I think as we look at that, it's fundamentally important to continually push and drive in that domain, but it also takes concurrent learning with our people. And as we define again those modular open systems architectures, we got to have multiple players. And I think we have represented here on the panel two very innovative entrepreneurial leading edge. This is how the United States and our partners and allies are going to compete against civil military fusion and command directed. It's going to be leveraging the diversity and the richness of thought, the experimentation. It's the rapid application of innovation in that entrepreneurial spirit. When we align that with the unity of command and unity of effort, there's nothing that can stop that. I give you one simple example. If you look at large language modules and you look at the trillions of yuan and command directed activities, who first generated ChatGPT 3 and 4. Now look at Gemini coming out with Google. The list goes on and on.

This is just the beginning of an incredible period of time. And so it mandates, it mandates daily study and learning to keep pace with the rate of progress and advancement, but that we must do because this is critical. As the secretary has outlined, the command and control and the battle management in the modern environment is so complex, so dynamic. When we talk dynamic targeting in a great power competition or a pure conflict or crisis, this is what is the mission imperative and decision advantage is going to carry the day. We've seen that in Ukraine already. As you look at Ukraine and as a space person



here, that has been the David and Goliath level. Or as we look at just, I'll just throw out four names. If you look at SpaceX's Starlink, you look at Maxar, Capella and ICEYE, it has been absolutely transformative in terms of taking imagery and available since we know we have a classification problem, allowing it to be leveraged, exploited, analyzed, and acted upon with confidence and trust. It is speed and rate that have changed the tone and tenor.

And so this is absolutely the series of lessons that we've been learning. But so too has the rest of the world been paying attention. So we don't take this for granted. Again, it's as I outlined up front, our third line of effort for the space force is partner to win. And when we must and partner first among that is the industry side because the nexus of the knowledge, the nexus of the capability is there. But people like Dr. Graves who are driving from the policy, from the governance, the implementation and amplification of that OSD Chief Digital and AI office. But driving that down, and I frankly think I'll go out a limb, I can say this probably now that I'm an alum of the CDAO is, I think they're the furthest and farthest ahead among all the services. It's a collaborative effort and activity though, and we will look at that. I know Luke and Dr. Brian Tipton are driving that into the acquisition side at every level.

So this is how we're going to get there. Hope is not a strategy, pragmatic outcomes based, vigorous activities every single day is how we're going to do it.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

All right, thank you so much. We got about a minute and 30 left. Real, this is going to be a quick lightning. In a word for each panel member, what excites you the most or scares you the most about AI in the DAF Battle Network?

Ian Eishen:

In the DAF-

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Or AI in general?

Ian Eishen:

So I think what excites me the most, I'll put the word, is collaboration. If we assume that everybody's... It's going to be commercial, it's going to be bespoke military, it's going to be government, it's going to be allied, we need to start with an idea that all of that's going to happen. And so by building everything in a collaborative environment or in an open source standard or in a way that multiple proprietary solutions can come together to build one DAF Battle Network and that network can then change based on the needs. I think that's the biggest exciting thing in front of us.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

It's all about collaboration to get a DAF Battle Network and tools we can trust. We got to collaborate. Sean, what excites you or worries you the most?

Sean Moriarty:

Yeah, what excites me the most development and capabilities, I mean the general said it all. The reality is the rate of innovation here in the United States is profoundly fast and our best tech is profoundly good. What I would ask everybody in this room to think about is the gap between the development of our capabilities and the implementation of those capabilities. And the more we can shrink that gap and



think about that as the primary problem that prevents us being as well-equipped as we can be, will make an awful lot of progress.

Dr. Lynne Graves:

Emerging technologies to the warfighter faster. I've been around for a while. I've watched ABMS morph into the DAF Battle Network. I'm excited that it's going down this path and hopefully providing us a template that we can keep leveraging over and over and over again to speed up and get emerging technologies, not just today's technologies to the warfighter. Again, emphasize the warfighter faster. Thank you.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Final word.

Maj. Gen. John M. Olson:

One word, opportunity. We need to boldly seize it through diligent, collaboration and cooperation. Because the nation that leads in AI will lead the world.

Maj. Gen. Kimberly A. Crider, USAF (Ret.):

Outstanding. Thank you so much, panel members. Thank you audience. Enjoy the rest of your day.