Maj. Gen. Kimberly A. Crider:

Good afternoon. Thank you. It's not afternoon yet, is it? It's afternoon somewhere in the world. It's good to see you all. We have a wonderful audience with us here today. Thank you so much for being here. Hopefully, the conference has been an exciting and engaging opportunity for you. I have just been thrilled with meeting all of the folks that are here this year. This is a record- breaking year for ASC, so it's been really fun to be out there. I'm Kim Crider, Major John retired, I retired last year, it's hard to believe it's been a year. And I think I have a lot of friends in the audience, thank you so much for being here to listen in and hear some of these interesting perspectives that we're going to bring you today on space warfare. I will tell you, in the time since I've retired, I've had an opportunity to be out and about in industry, and there is some amazing innovation going on out there today.

We're seeing a lot of that here at the conference, of course, on our exhibit floor. Our industry partners have come out in full force, large, medium, small companies that are joining us, and really showing us all of the great capability that they're bringing to bear, to advance our war-fighting capabilities, not the least of which, our war-fighting capabilities in space. So we're going to talk a little bit about space warfare today, and what's interesting is that you have a space warfare panel that is made up of industry, industry leaders, which really speaks to the shifts that we're seeing out there, in terms of how critical ... certainly, industry has played a critical role in our war-fighting capabilities since the beginning.

But when it comes to space warfare and the space domain, we're seeing even an even more critical and vital role that industry is playing as a partner in the process of not only developing and delivering capability, but integrating those capabilities with our military capabilities, as part of our overall integrated architecture. So we're going to talk a little bit about that as we get into this today. I'm going to give our panelists just a couple of minutes to introduce themselves, and then we'll kind of roll into it. So let's go ahead and get started. Stu?

Jim Reynolds:

Thank you, ma'am. So my name is Jim Reynolds, I'm at SAIC, working the defense space account for them. I started about six weeks ago, so pretty new at SAIC, learning the organization and the mission. Before that, I was at Raytheon Intelligence & Space in El Segundo, working missile warning, missile tracking, types of programs. And then before that, I was in the Air Force. I retired in 2019, working primarily space programs, both on the acquisition side and the operation side, across what was then, Air Force Space Command, the National Reconnaissance Office, headquarters, Air Force, working space superiority programs, missile warning programs, primarily.

Maj. Gen. Kimberly A. Crider:

Thanks, Jim. Shon.

Hon. Shon J. Manasco:

Well, good morning, everyone, Shon Manasco. It's great to be back at the Air and Space Conference, cyber conference. And I, today, work at Palantir. I've been at the company two months, and prior to that, I worked alongside many of you, to include General Crider, at the time. So I would be remissed if I didn't say thank you publicly for your partnership when we were together in the Pentagon, and really, your thought leadership, and how you looked at data and really drove a strategy for the Space Force and its creation. So Kim and I worked together, I was acting under secretary at the time. And like I said, it's

great to be here, and particularly, it's fascinating for me to be here on this stage with my two colleagues here, and talk about this very important topic. So I look forward to getting into the discussion.

Maj. Gen. Kimberly A. Crider:

Thank you, Shon. Stu.

Bryan "Stu" Eberhardt:

Yeah, thanks, General Crider. Thanks to AFA for putting this on and inviting us to come speak. It's always fun to get back and get close to the uniformed folks again. My current role at Boeing ... I've been at Boeing since 2015. I manage the internal research and development funds across both our commercial and government sectors, so we're seeing things in a much broad perspective on what space warfare and the potential of space warfare is doing, both from the government standpoint, but also, on the commercial side, which we'll get into today. Before Boeing, I had 22 plus years or so in the Air Force, and did a couple assignments through space superiority. So back in the day, I was with Jimmy down there, and we were the Chicken Littles, telling everybody the threats coming, the threats coming, and it finally showed up. And it's good to be part of the solution still, and outside in the industry, and looking forward to today's talk.

Maj. Gen. Kimberly A. Crider:

Thank you. Thank you very much. Okay, so just to kind of open things up a little bit, it's hard to believe, but it was really just five years ago that then Secretary of the Air Force, Heather Wilson, and three top Air Force leaders, Chief Goldfein, Chief Raymond, and Lieutenant General Sam Greaves, who was leading at the time, Space and Missile Center, told Congress, and really, this was the first time that this was kind of a declaration, space is no longer just an enabler and a force enhancer for our US military operations. It is a war-fighting domain, just like air, land, and sea. And freedom to operate in the domain is no longer guaranteed. We heard this again just this past week with Lieutenant General Saltzman, as he went forward for his confirmation hearing, reinforcing these critical points that were made five years ago, to Congress now.

And also, the countries which pose the greatest threats to the United States' assets in space are not surprisingly, Russia and China. So in the five years since, our national leaders have responded to the growing threat and the risk it poses, not just to our way of war, but in fact, as we all know, to our way of life. In these last five years, we established United States Space Command, charged with the responsibility to defect, to protect, and defend US and allied national interest in space. We stood up the United States Space Force to organize, train, and equip for space operations. All the while, our adversaries have become more belligerent, as witnessed by China's aggressive SJ 20 actions in space, and Russia's [inaudible 00:07:22] and [inaudible 00:07:23] launch, continuous jamming and cyber attacks, not just on US and allied government-owned systems, but commercial systems, as well, as we saw in Russia's attacks on US commercial Satcom capabilities during the Ukraine crisis.

There can be no doubt that the age of space warfare is upon us. Space is contested, and any entity, nation, state, commercial, civil industry, academia, research, that wishes to operate in, through, and to the domain, does so at risk. So what can we all do about it? What role can industry play in helping to deter conflicts in space, to raise awareness of the threats, to accelerate and enhance the capabilities of our space war fighters around the world, and to promote safe norms of behavior, and increase resiliency in the domain? I'm going to turn now to each of our panelists to share their thoughts on the role industry is playing and should play more of to deter space warfare, and help protect the ultimate global

commons of space. So let's start down at the end of the line with Jim. Jim, from your perspective, what role can or should industry play to help deter conflicts in space, or enables space war fighting?

Jim Reynolds:

Great, thank you. I appreciate the opportunity to get to share my thoughts with the audience here today. I think, for me, it really starts with creating that digital environment or ecosystem, or whatever buzzword you want to use. But it has to be one environment that you can coexist industry partners, government, commercial, international, at the right level. And that's the hard part, is determining how to do that in one environment, instead of many environments. And then, how do you do that, but still be able to protect the information, the classification of certain levels? We have various levels of classifications and access, but it's also for industry. How can you protect the intellectual capital, the intellectual property that comes along with providing that? But once you have that open, accessible, trusted environment, the abilities to use that environment are endless. Starts with being able to really do that forced design work, and prove out what you need, and then enable the introduction of various capabilities in a more continuous integration, continuous delivery process, so you can stay ahead of the threat, you can be adaptable to changes in the environment, and you can prove that out.

And then lastly, you have to have the data, the information, accessible. We love to talk about the sensors and the systems and the rockets and satellites, but those are the means. I mean, those are the cool means, so it's nice to be working on those capabilities, and they're very, very important. But it's really, how do you take the information that those means provide, and turn it into decision quality and trusted information that we can use to maintain resiliency across our space enterprise? As we introduce more and more systems into this environment, it becomes very complex, and then we can take advantage of the opportunities that the information technology age offers for digital engineering.

Maj. Gen. Kimberly A. Crider:

Thanks. Let's pick up on some of those themes that you laid out there, Jim. Shon, I know from your perspective, you've thought a lot about data, and you've thought a lot about the importance of data in support of war fighting operations in, through, and to space. What are your thoughts in terms of the role industry can play to enable more effectiveness in the domain?

Hon. Shon J. Manasco:

Well, I think I agree with a lot of what was said, previously. Here's the way I kind of think about it, and Kim, you touched on just how things have changed in space. A few things that I would just note, our adversaries, Russia and China, and we can talk about the things that they've done recently, and we can talk about just how irresponsible some of those activities we might find, I will say that, in particular, I really appreciate Secretary Kendall's focus on China. And I think it's fair for us to just acknowledge in this room that we are in competition with China, and China is playing a game, and it's a game of go. And we sometimes like to play chess. So we should be thinking about all that they're doing on orbit as them playing the game go, and taking the real long view.

And so, I think for us, what that means is, we have to acknowledge the game that we're playing, especially with that particular adversary. Now, bringing that closer to home, one of the things that I think we have to do as industry to help the war fighter is, we have to partner better together. So at Palantir, really, our focus primarily is on data, and creating a data fabric that we can blend in together, national assets that we might have on orbit, but also, to pull in commercial satellite data, and weave that together, ingest it, and make it in a usable format so that we can then transmit that to users on the ground, and/or war fighters that are sitting at SpaceCom.

And so, for us it is about partnering with one another, but also being able to field a set of capabilities that do allow us to ingest, for us to then fuse together that data, and then turn it into something that is actionable. And that's where our focus is today, and those are some of the things that we're doing in support of the space war fighters, especially as it relates to domain awareness.

Maj. Gen. Kimberly A. Crider:

Outstanding. Thank you so much. Stu, let's pick up on this idea of partnering and increased collaboration between industry and the government. And from your perspective, what does that look like, and how do we increase the amount of partnering that goes on? There's a lot that goes on today, but how do we take it further, so that we can really continue to advance our capabilities and our ability to deliver those war fighting capabilities more effectively?

Bryan "Stu" Eberhardt:

Sure, thanks, ma'am. So if you pull on the thread, and you start the thread off with, the ideal position is to provide you the war fighter what you need to get the mission done, and make sure that you come home safe. So if you start with that objective in mind ... I'll be additive on the comments, because I agree with everything that Jim and Shon were saying about working together. A lot of the environments that we are talking about, you can't actually go test and try out these capabilities on orbit, so you need the digital environment, you need to partner closer. I'd like to say, the real nugget of this is, how do industry partners get in your head space? What are you thinking about as the war fighter? What are you thinking about as the operator, when you're going to use a system? What are your TTPs? How do you think about the kill chain? How do you think about the threat? How you're going to use the system, and maybe you use it differently than the way it was built, and its intended purpose becomes even better.

And I think to do that, you have to really kind of focus on, where are the current and future leaders' minds? And in Boeing, we do a lot of research on papers that you all write at Air War College. I'll give you an example, General Hyten wrote a paper when he was a lieutenant colonel back in 2001. His wife corrected me last night, he published it in 1998, Sea of Peace, Theater of Conflict, the Inevitability of Conflict in Space. It's a great paper, it's a mandatory read for most people at Boeing that are getting into the space environment.

And why? Because to better allow the engineers to innovate and provide the capabilities that you need to go to war, we have to understand where you're thinking. What are the things that you require? And outside of the partnerships, which, we'd love to do that, right? And outside of the environment to operate in, getting into that mindset, and being able to speak the same language. When you come over, and we're going to do a mod sim run of a GEO, HEO orbit scenario, already speaking the same language because we've been researching, what are the problems that you're staring into and what you're thinking about, is crucial to moving forward in that partnership side.

Maj. Gen. Kimberly A. Crider:

Great. Thank you so much. So increasing the integration through the digital thread, leveraging data across that digital thread more effectively, as we look at space war, fighting, space war fighting needs, and working very closely together through active collaboration, so that industry and military can approach our war fighting challenges from a common perspective, as we're leveraging data and digital capabilities. These are all critical to enhancing our ability to be effective in this domain. Shon, you talked about China, and you talked about the formidable adversary that they are. And certainly, they're playing the long game, and presenting capabilities that are significant.

But Russia is an important adversary, too, and we've seen play out, of course, all of us have been watching play out in the Ukraine crisis, some of the ways in which space and cyber are vulnerable to attacks. And we have always often said that conflict will begin in space and in cyber, and we've seen that occur. From your perspective, of industry's perspective, as you guys have watched this play out, and we've seen that, while the Gulf War was the first space war, Ukraine has really become the first commercial space war. What do you think the Ukraine crisis has taught us, regarding the role of commercial industry in space warfare?

Hon. Shon J. Manasco:

So I'm happy to start and open it up to my colleagues. So to me, as I step back and I look at the conflict that's happening there, to me, it's a classic David versus Goliath kind of engagement. And we've seen recently, the success that the Ukrainians have had. Now, we all know that we don't have boots on the ground in the Ukraine. I will say that, from a Palantir perspective, we have deployed forward with our partners within DOD, and we're working closely with western allies to really help monitor troop movement and combat activity. And so, we're very proud of our embedded analysts and engineers that are engaged in that work.

The thing that strikes me, though, is, outside of the will of the Ukrainian people, the importance of software and data, and what that's doing to give them the upper hand. It's clear that commercial satellite communications and imagery is being used now more than ever. And to me, while we are collectively engaged in this fight, it's one of the things that I believe we can create environment and a set of dilemmas for China, if we can, in our commercial entities and work with our national assets, to prove that we can work together and integrated. And it will also get at the resiliency that you talked about, that's so very important, and that Secretary Kendall has talked about, as well.

Jim Reynolds:

Yeah, pick up on the resiliency theme a little bit. So recently, the Space Systems Command hosted what they called a Tactically Responsive Space Industry Days. And I was very impressed with the messages that came forth from Space Force leaders, General Guetlein, General Bythewood, General Sejba, about how tactically responsive space isn't a separate thing, it's something that we need to have inherent in all of our capabilities. And so, where that comes into play with resiliency is, you have to fight with what you practice with. So that was a quote from General Guetlein, and I'm sure many higher up senior leaders, but it resonated with me in terms of, if you don't practice with these commercial and international capabilities, and information that those capabilities can provide, whether it's to reconstitute capabilities that we have inherent in our architectures, that we may lose through a threatening environment, or the ability to support our allies in their conflicts without, as Shon mentioned, putting boots on the ground.

We have shown our allies the way that they can leverage existing capabilities into their way of defending their nations, as well. And then, finally, just to get back to the original message I had earlier, it's really about the data and the information, less about the systems, or the means to get that data. And so, making that data accessible when you need it, to make the decision quality and real-time decision making that it takes to execute war fighting in this age, it's not just space war fighting, this is war fighting that we're doing.

Bryan "Stu" Eberhardt:

Yeah, I might add on, if I can, this will sound a little strange, but normalizing the conversation around space warfare has had a net benefit for what I would call the nonstandard DOD industry, commercial entities in particular, where they used to, as an example, for Satcom, they would deal with frequency

interference. You're selling your service, and you've got interference somewhere, which means you're dropping bits, and you're not able to sell that service, and you're losing revenue. Well, break break, change narrative, and now they'll just call that a contested environment, and it's jamming versus an interference. But the fact that we're talking openly about it, and we're having conversations about space warfare, has got the commercial industry starting to think about not only how they can apply principles and activities and things that they do as a course of action of normal service providing, but also now, how can I customize, or what can I do differently to this commercial activity that I have, that could benefit the war fighter and be used in a contested environment?

And if they are working down that road, now it's, how do you get into the space where you're actually allowed to practice with that system, and actually buy that service and utilize it so you, the war fighter, can figure out, is it meeting the need? And then, provide that feedback loop to the commercial side. And I think the whole discussion and narrative around space warfare has really opened it up. I can tell you, looking across both market spaces, the conversations we're having today with the commercial services providers that we build satellites for, are drastically different than they were four or five years ago, drastically different, and I think net benefit to the US war fighter in that, we're able to kind of openly discuss, there are problems on orbit, and there are things happening, and commercial does have a place to play. I think there's still going to be a need for the purpose built systems, but certainly, any resiliency I inherently drive into my commercial systems, it's going to be net benefit.

Hon. Shon J. Manasco:

Kim, can I also jump in? Just one other thought. This idea of ... I grew up in a different service early on, and then I came to my senses and came to the Air Force. I hope this is not recorded, so my Army brethren don't see or hear that. But the truth of the matter is, this idea of train as you fight, is a really important concept. And so, as I look out in this audience with a group of war fighters, here's what I think you should challenge us in industry to do, is truly partner. Because what I would rather do to better deliver you a solution that is useful, is to force the integration of our collective strengths before the need is there.

Because what happens sometimes is, we don't necessarily always do that, and then when we have a crisis, then we're trying to scramble to make things talk, and set up the data integration like you want it to, so that then, we can turn it over to you for you to do your jobs and do it effectively. Just imagine, though, if you were to challenge us with partnering on the front end, how much easier it would be, the next time we enter into a live conflict, you're not going to be scrambling around, we're not going to be scrambling around, and you're going to be that much more able to, again, do the job that you've been given to do.

Maj. Gen. Kimberly A. Crider:

Yeah, great point. Jim, let's pick up on what you said. I loved what you guys were saying here about, normalizing the conversation has been absolutely critical, not just to get the American public and Congress more aware, but also, so that industry can be thinking about what they're delivering in new and different ways. And Jim, you mentioned tactically responsive. Tactically responsive is a mindset, right? There's certainly very specific things that we see our US military, US Space Force asking for, from a tactically responsive perspective.

And I think you made the point that tactically responsive is part of this new way of thinking. It's this new way of making sure we can posture ourselves to be tactically responsive to the threat, and to ensure that the capabilities that we're planning for are positioned for that, so they are go ready. And of course, we need to be able to integrate those in, and work with those early and throughout the development

process, as Shon said, to be able to challenge industry, to be in the fight up front, throughout the planning and development and delivery. What do you see, Jim, perhaps, as some of the obstacles to that collaboration, and to industry really being able to develop that tactically responsive mindset?

Jim Reynolds:

Yeah, I would say, the biggest challenge right now is the connectivity from the strategic, operational, and tactical levels. There's really no environment available that allows that interconnectivity at those levels. And it's critical, because in order to be tactically responsive, you have to understand how you fit into the broader strategy. You have to understand how you fit into the broader war fighting strategy, not just space. So that begins with operational exercises, the modeling and simulation of how the data and information that can be provided from assets in space, sensors in space, can enable the joint war fight, the joint all domain command and control interconnectivity, so that, when we do these operational exercises, or bring in our international partners, or introduce non-traditional capability providers, they can understand how that fits into the strategic picture, down to the operational level.

And then, from a tactical level, then you have the specific operators really understanding their relevance to the joint war fight. And instead of just being one piece, or protecting their one piece, they understand how that fits into the broader picture. And that's important from a training and a testing and a trust perspective, because at the end of the day, this is really about relationships, building trusted relationships, whether that's from industry to government, or between acquisition testing and operational communities within the Department of Defense, or finally, extending that to our international partners, as well.

Maj. Gen. Kimberly A. Crider:

Great. Thank you so much. And I want to pick up on this thread, too, with you, Stu, in terms of your thoughts on this, and also, if you would tie in the international piece. We've talked a lot, we hear a lot about Allied by Design, so it's a focus area, it's really important. How do we bring our international partners into the process early, and throughout the design, development, delivery, operation of capabilities. From an industry perspective, and in order to be most effective and resilient and responsive to this threat, how do you think about Allied by Design?

Bryan "Stu" Eberhardt:

Sure. So I've been lucky enough to have been part of the WGS program, which has a multilateral MOU signed by ... geez, I think we're up to 12, maybe even 15 countries now, where they partner with the US on utilizing Satcom off of the WGS system. And you see a lot of activity, I think international space is exploding, a lot of activity with the Australians wanting to be contributors and not just consumers to the fight, and bring their own systems in. But you're seeing it everywhere, and I would offer up that, when you talk about Allied by Design, that we're talking about industry leaving the hooks in to ensure that when the coalition comes together, and you're in the ops floor, the coalition ops floor, that you guys are all operating off of the same systems, and their systems are interoperable with US systems.

And that's what industry's worried about, industry's worried about, how do we ensure that we've got the hooks in there, and are we using the right standards? Are we using the right interfaces? Are we designing appropriately? We would also kind of take the position that, I think you would much rather have the systems built in the US, and sold with that interoperability in mind. And so, how do you then start working through release ability of technology to allies? And I think we've seen some success and movement on that front with the US government in ensuring that what we are providing to our allied partners is up to the standard and up to par with what we expect as US war fighters.

And so, I think there's good movement there. I think there's a little bit more can be done around the clearances and security. I think we always kind of talk about that. There's mechanisms and ways that have been opened up to be able to have the knowledgeable discussions with our allies about the true threat and nature of what is happening in space, so that they can effectively respond. The more I think you share with your allies, I think the more they're willing to step up and bring those systems with the hooks to have interoperability to the fight. So that's what I think about when I think about Allied by Design, is kind of along those three chunks.

Maj. Gen. Kimberly A. Crider:

Great. All right, let's talk a little bit about something that we've just heard very recently in the news, and certainly has been kind of fall out from the recent conflict activities in Ukraine. And this is the discussion that's going on in the halls of OSD, in particular, about, well, what if a commercial company is caught up in the conflict? We know we want to integrate commercial capabilities into our hybrid resilient architecture, but what if those commercial capabilities are damaged in the conflict? What kinds of compensation or indemnification needs to be considered? And how do we think about that as we continue to increase the partnerships between our purpose built capabilities and our commercial capabilities, and the providers of those, to enhance our overall war fighting capability? So Shon, let's start off with you, and get your thoughts on this conversation that's going on.

Hon. Shon J. Manasco:

Well, I'll answer very succinctly. I remember being in the Pentagon and going through all of the war games that the teams would run. And one thing always emerged, and that was, if we don't win in space, we don't win. And make no mistake, winning matters. And so, from my perspective, if commercial satellites get caught up in some irresponsible behavior, then we have to do what it takes as a nation to win. Now, if that means addressing this policy and being clear about what the federal government will do, I think that is something that is absolutely imperative, if, in fact, we value winning. And I know that, I speak for myself, I certainly value winning.

Bryan "Stu" Eberhardt:

I add onto that, I'm very excited that the conversation is starting, because I think the commercial providers are looking for that kind of conversation. Commercial industry is very different in how it gets incentivized to do business. And if the government's waffling on the fence about whether or not they're investing in a service that they want provided, it may not be exactly what you need, but if you can incentivize the commercial side to say, hey, look, we're going to ensure that, as we utilize your services, if something occurs, that conversation happening gives the commercial industry at least a target out there to think about how they're developing their next generation systems, and incentivizes them to think more about you as the customer, versus just the standard services that they provide out there, whether it's cruise ship, airplanes, all the different commercial services that they pride. So I think having this conversation at this point in time is key, crucial, and I think commercial industry is really going to value, if not a decision, at least the fact that we're acknowledging that this is a potential out there that could happen.

Jim Reynolds:

Yeah, I think Stu and I have been hanging out too much together, because I was going to talk about incentivizing, too. Because that's the way I thought about it when I heard about it. We need to pull out any incentive possible to encourage this type of behavior. We're encouraging companies or groups or

non-traditional thinkers to take risk, and one way to do that is by providing some assurance that, if your risk goes badly for you, that the government can support you and will support you for taking that risk. So it's just like any other type of investment, it's an investment that I think the government is putting up their backing towards. And I think it's a great way to make sure that we're all working together, bringing in all the capabilities that we can, all the data sources that we can, to take on this threat.

Maj. Gen. Kimberly A. Crider:

Really well said, thank you so much, all of you, for your thoughts on that. So we're going to wrap this up. Space is a war fighting domain, there's absolutely no doubt about it. And what we've certainly seen play out, and what we've heard about today, is that it's an absolute team sport when it comes to space warfare. We've got to continue to focus on getting those critical purpose built capabilities out there, but we've got to integrate commercial capabilities into the fight to have that truly capable, resilient, hybrid architecture that's going to ultimately help us win.

Shon, you said it best, if we don't win in space, we don't win. And we win with data, we win with integration, we win with digital insights, and we win with the best capabilities that we can bring to bear. Thank you. Thank you for your thoughts. Thank you for your insights. Thank you for being part of the team. It is, in fact, one team, one fight, and we're going to win together because of the capabilities that you all bring, and the insights and ideas that you help us innovate on, that are going to continue to help us surge forward. Thank you all for being part of our panel today. We look forward to your feedback.

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