**Mr. Riki Ellison:**

Good morning, ladies and gentlemen, welcome. Our support for all of you and your friends and family during this time period. Want to make sure we're well aware of it and we're going to get through it and we're looking forward to getting through it. We're going to fight through it. I wanted to give that to you. I'm Riki Ellison. I'm the chairman of the Missile Defense Advocacy Alliance. I founded this group in 2003. Its sole mission is to develop and evolve missile defenses, both joint with our allies, our nation, make our world, a safer place, our nation a safer place. We're seeing that happen and it continues to grow and make stability throughout the world.

**Mr. Riki Ellison:**

Today, we're here to talk about something very interesting, and really relevant to the status quo in the world today. It is the future of our Command and Control. And as we look at our national defense strategy that was initiated to move us beyond our current conflicts into a competitive competition with Russia and China, we have to relook at how we do things. But in both China's positioning, especially now with the virus, and their abilities to overwhelm our current capabilities, that we've seen in the South China Sea, we've seen in developing long distance capabilities and so forth, so we have to readjust our strategies and thought processes on it.

**Mr. Riki Ellison:**

I think one of the key things is being able to give our decision makers the edge, and giving them the edge fast and quick with as much technology and as much information as possible, and linking all of our sensors and linking all of our C2 modes, linking our ability to have effect as quickly and fast and being able to now make it more efficient than what we are today. We're relying on kill chains that are 30 years old. They're great, but [they are] figuring out how to penetrate those would be able to disrupt those. We've got to get in position much better and we've got to look at the other aspects of the going the left of launch, of being able to combine offense with defense and being able to have a more effective regional deterrent and a more effective strategy for our near- peer competition.

**Mr. Riki Ellison:**

With that, we recognize the Missile Defense Agency and what they've done with our ground-based missile defense system, where they've done the C2 that's working today, that has leveraged joint sensors and cross domain sensors and capabilities, and both the factors to be able to defend our nation and defend our nation strong for almost 20 years, doing that through a Command and Control at Schriever Air Base that's been very, very successful on doing that. How that evolves and how that fits in to the overall Command and Control that we are now readdressing or [inaudible 00:03:50] through how we can make it better and make our country better because of it.

**Mr. Riki Ellison:**

What I would like to do today is we've got some fabulous speakers. I think the best in our nation, the best in the world at what they do, we're lucky to give each of them time to be able to express their viewpoints and their vision. After that, we have a discussion that between the board members virtually here. Former Under Secretary John Rood, we've got Tony Manganiello, and they will be able to answer your questions. We're going to ask all the questions, it'll be anonymous, so [inaudible 00:04:29] your name. If you do have questions, please email us at questions@missledefnseadvocacy.org.

Mr. Riki Ellison:

That's the discussion today. Our first guest, we're quite honored to have Major General Michael Fantini. He is the A5. For people that don't know what A5 is, he used to be a direct report to the Secretary of the Air Force and the Chief of the Air Force for strategy and immigration requirements. It's a prominent position that looks at the full integration of the force, for the Air Force, and for other joint services. He also is a war fighter. He also comes from some great experiences in the Middle East, doing those kill chains and understanding the [inaudible 00:05:25] land capabilities that we've been doing, and he has worked inside The Pentagon and the policy aspect of it. We have a great opportunity to hear his viewpoint and his vision of where he sees the Command Control coming forward in the future. Welcome Mike. Major General, thank you.

Maj. Gen. Michael A. Fantini:

Hi, Riki, thanks for the intro. Yeah, I'm the Acting 5. I got a lot less time on front than I do on the back side. I got five weeks and we'll do another good transition, but one of the things that I want to also highlight is I had the opportunity to be the Air Force War-Fighting Integration Capability Director before I stepped into this A5 position for a few months. That's really the chief and the secretary's vision of how do we better integrate within the Air Force to create more synergy? I think the topic that we're going to have today in the macro of Command and Control is right for that discussion across the department. I think, actually, the silver lining of this COVID response that we're seeing right now is the reality of forcing this distributed aspect of how we continue to get work done.

Maj. Gen. Michael A. Fantini:

And this unfortunate situation of having to do this on Teams is kind of one instantiation of it. We've been fighting to get Teams capability for the last six months in the building, in the Air Force. And the answer was, "No, talk to the hand, we're going to get it. Blah, blah, blah." Not until a crisis hit did it force us to do this. And so it's much simpler to do it in an unclassified environment. It's more challenging, but it's still attainable in a classified environment. If anything, on this COVID piece, which is immensely unfortunate, it is forcing some elements of this distributed aspect of the ability to communicate across a broad spectrum, and utilizing things that are out there now commercially. I think that's actually a pretty interesting topic to delve into. But what I'm going to do is, I want to talk from the Air Force perspective, from the Department of the Air Force perspective for both air and space capability, but from, I'm going to do the overarching big picture concept piece.

Maj. Gen. Michael A. Fantini:

But what is really quite interesting is, we see the work in the building coming together across all services. I would say we have, in general agreement, on the fact of moving into the future, we have got create systems with the appropriate interfaces so that we can talk, so that we can communicate. Blinding flash of the obvious, but that's something that we've been getting an F minus on for any number of years. I'll pick on the Air Force on fifth generation, next generation capabilities, whether it's B2, F35 and F22, there's a reason they're not talking to each other, because of decisions made 10, 15, 20 years ago, but we've created a system where we're not agile enough to be able to fix it. That should be maddening to us, absolutely maddening to us.

Maj. Gen. Michael A. Fantini:

One of the things I want to highlight, from a Department of the Air Force perspective is we're committed to making the national defense strategy irreversible. We see that, moving into the future, is the ability to

create a sensing capability that's able to communicate with other entities. We're able to take that information and port it back to folks who need to make the decision. There has to be an aspect of battle management, then that decision needs to be communicated to folks who can create an effect in the battle space. That's the overarching very high level macro Air Force operating concept.

Maj. Gen. Michael A. Fantini:

I need to sense, I need to port the information, I need to make a decision about it and then I need something that's effective that can create and coerce the enemy to do something about it. We see that, from our neck of the woods, as the ability to bring space, cyber and air capabilities together, from a synergistic perspective, to connect in with subsurface, surface, land and other aspects, to create that element of convergence, that had General Wesley been here, he would talk very aggressively about convergence, which we all agree with, at a time and place of the joint forces' choosing, to compel the enemy to do our will.

Maj. Gen. Michael A. Fantini:

In the macro, I explained a [inaudible 00:10:25]. It's almost about that simple. From an Air Force perspective, we see the need to maintain foundational nuclear security. We've got to maintain our ability to defend the Homeland. But the future, the attributes of their future force, is we want to be able to connect with the joint force, we want to be able to dominate space to win. We have to be able to generate combat power that creates an effect on the adversary to compel them to do our will, and we have to be able to logistically support that.

Maj. Gen. Michael A. Fantini:

If we're able to pin those six things together, we're going to be able to compete, deter and win, as was identified in the National Defense Strategy. That does not come with any number of challenges. It's very easy to pin a concept and talk about a concept. It's much more challenging to take that concept and draw a line all the way back to what you're putting behind that from a resourcing perspective. That's what we're doing, whether it was the FY21 POM that's gone over The Hill, and what we see going into the future. But the attributes of the future [inaudible 00:11:39] the ability to connect with the joint force, the ability to dominate and win in space, the ability to generate combat power of relevance, both from distance and from within, or close to the battle space, per se, or close to the enemy, and then you have to support it logistically.

Maj. Gen. Michael A. Fantini:

We see the ability of the Joint All-Domain Command and Control, that enterprise vision that the department is advocating for, and that we've had numerous joint requirements, oversight council, there's direction that has come out of that for joint world on what that means. We see that as instantiated into what's called advanced battle management. The Advanced Battle Management System, ABMS, is the quick acronym you'll hear. We don't want that to be prescriptive. We see that as a need that the Air Force needs to change. We have got to get into the 21st century.

Maj. Gen. Michael A. Fantini:

That begins with our foundational network infrastructure that we're taking action on, and then it begins with the ability to iterate as fast as the enemy. Like Secretary Mattis would say, is the speed of relevance to the war fighter. With that, I'll kind of just top off my comments with one, thanks for inviting us to be part of this, number two, we view anything that the Air Force is doing needs to be able to communicate

and plug in with the larger joint architecture and the larger joint enterprise, which we're total advocates of. I really look forward to taking any questions that anyone might have later on in the presentation. With that, Riki, I turn it back over to you. Over.

Mr. Riki Ellison:

Thank you, Mike, Can I just ask one question of you? What are the three biggest challenges you see that's standing in your way to make that happen, that you discussed in the big vision, from your perspective?

Maj. Gen. Michael A. Fantini:

Yeah. I'd say one of the largest challenges is the conventional wisdom. The example I used of the F22 and the F35 not being able to talk to together. Based on the lineage and how those programs came to initial operating capability and full operating capability and the con ops on how they were going to be used, that occurred decades ago. We created a system where you have to be able to forecast your requirement five to 10 years into the future. It's going to be 26.7 gigahertz. I don't know what that answer is. We're not that precise, and technology's changing so fast, that we've created a system that we're not agile enough to make adjustments.

Maj. Gen. Michael A. Fantini:

There's huge cost implications. There's huge intellectual property challenges and there's huge operational effects that are being lost, because of our lack of ability to move past. I think one is there's this element of bureaucracy, and there's this element of this legacy requirements mindset, that needs to get into the 21st century, if you will.

Maj. Gen. Michael A. Fantini:

Secondly, we can make all the great, wonderful decisions we want in the department of the Air Force, but we have outside constraints and restraints that are the other agencies, or organizations or stakeholders, that because of our system, they have an opinion and they can affect those decisions. We're going to put our best military advice forward to the secretary and the chief. The secretary and the chief will make decisions. They'll have to put the political lens, or the do ability lens, on this, but there's a lot of proselytizing that needs to go on across the department to gain consensus in these various constituencies.

Maj. Gen. Michael A. Fantini:

Now, some of that is not a bad thing, but too much of that is a hindrance. If the Secretary of Defense is providing guidance that I want to make the National Defense Strategy irreversible, we have to be able to make decisions and make them stick and move forward. Easing those types of challenges, whether it's The Hill or these outside constituencies, we need to kind of continue to aggressively work. You asked for three, I gave you two, and probably spoke too long anyway. How's that?

Mr. Riki Ellison:

Thank you, Mike. Appreciate your advocacy and your education of this subject. Our next speaker is very unique. First position ever held for the Air Force and the Space Force. He is the chief architect for the Department of the Air Force, Preston Dunlap, and I'd like to go into all of you, that the resumes are ridiculously impressive, but at the same time, I don't want to disrespect you Preston, but you've done a

great, great history in what you've done over your life. I want to present you to give us the vision, behind what Mike is saying, for the Air Force and Space Force. Thank you.

Mr. Preston C. Dunlap:

Great. Thanks Riki. It's just a real privilege to be able to be here with all of you. Thank you for your leadership in the missile defense community, in particular, General Fantini, thank you for your leadership here at the Air Force, and the opening comments have set the stage well for us. Real privilege to be here too, with our missile defense agency colleagues, with John and Stan, phenomenal individuals that are leading their agency very effectively, as well as on the Air Force side, General Kumashiro, as well.

Mr. Preston C. Dunlap:

Also a real privilege and opportunity, I think, for all of you that are listening and watching out there. It's a great time to be part of the Department of Defense. Lots of progress is happening. Progress is happening very quickly. That starts all the way from the Secretary of Defense and the Chairman, to include for us, the Secretary of the Air Force and our two chiefs, General Raymond and General Goldfein, but it extends, as well, out to the executive branch and to Congress as well, all agreeing about the problems that we're talking about today and the challenges as being the important, critical and timely issues to address as a nation now, both from an opportunity perspective and a challenge.

Mr. Preston C. Dunlap:

With that, let me spend my time here, if I could, just talking about three main ingredients that I think are important to be able to appreciate here. The focus on the missile defense problem is a phenomenal one to sort of crystallize the challenges and the importance that we have, both regionally, as well as globally, as it cuts across the whole enterprise. The three ingredients that I want to cover today, number one, we have the privilege of having a broad, but clear problem. Number two, we've got the opportunity to borrow and augment from successes in the commercial world and in the defense sector as well. Number three, we've got an imperative to creativity and speed.

Mr. Preston C. Dunlap:

Abroad but clear problem, opportunity to borrow and augment and an imperative to creativity and speed. Let's use that to frame, at least this portion, of the conversation. First, a broad but clear problem. Really important, so that you know what you're tackling and what you need to pull together to be able to achieve the end state. As General Fantini laid out, the National Defense Strategy makes it very clear about where we're headed and why we're headed there, and the environment around the globe that we find ourselves in.

Mr. Preston C. Dunlap:

That leads to various attributes, like the ability to be able to operate and sense and move across large areas, fast moving objects across that great distance are important to be able to understand, and then as potential adversaries, build up abilities to try deny the freedom of movement on all the domains; on the surface and land and air and space, contrary to sort of global norms. That move then, given where the National Defense Strategy lays it out, that move, imperative to be able to go from simply de-conflicting different domains and operations and fight, to actually integrating into a fight.

Mr. Preston C. Dunlap:

That's where Joint All-Domain Command and Control sort of arrives and hits strategy. And for the department of the Air Force, the Space Force and the Air Force, that technology pathway, we call Advanced Battle Management Family of Systems. It's nested inside of what General Kumashiro will likely spend some time talking about, with the joint war fighting concepts that are being developed. To be able to think about that and just put it very simple sort of sense, what we're really trying to do, both with the Air and Space Force, and in partnership with the tremendous work going on at MDA, as well as the other services, is to be able to operate as one team. That's one joint team, one coalition and partner team. You'll find we've used that as a handy moniker to be able to remind ourselves that our goal is to be able to operate as a joint team, and our contributions to that, enabling that Chairman and that Secretary of Defense imperative to actually happen.

Mr. Preston C. Dunlap:

You'll see some more capabilities and products that being developed with that one moniker, but I wanted you to know that that really defines, I think, that operational clear problem. Number one, I actually think we're in a great place, because we have that broad, difficult, but very clear challenge before us, that's really apparent and important to tackle. The second ingredient to talk about is that we actually have an opportunity to borrow and augment from the successes that have happened in the commercial world, particularly in the digital array, over the last 20-ish years. Part of this is important, because we've heard for years and years about lightening bolts, and what we call in DOD speak, OV1 charts that basically show lots of platforms and things that go between the data. They're lightening bolts and they're not always as real as we would like them to be.

Mr. Preston C. Dunlap:

We've also got talking points about making artificial intelligence and machine learning real, but why haven't we achieved those objectives that we really sought after them? The approach that I think is the reason for that, and also paves the pathway to how to overcome those challenges and make the talking points real, is that we basically need to take a page out of the commercial innovation playbook here and go through, in fact, we can much faster, but go through the same growth steps that the industry has done to great success in this genre of enabling capabilities and technologies, that make that Joint All-Domain opportunity real.

Mr. Preston C. Dunlap:

Phase one, basically, is getting good at software development. The Department of the Air Force, Space and Air Force, have been doing that as you've been seeing over the last two or three years, standing up dev ops development and operations together, software houses, to be able to code quickly and effectively and deploy that alongside the operators on, even an hourly basis, it's fundamental. Just like 20 years, 15 years, roughly, ago, when the software houses then began to move and see the power of what a cloud computing environment could give, that's sort of stage two, which is now not only software on a computer or a network center, but now the scale that-

PART 1 OF 4 ENDS [00:24:04]

Mr. Preston C. Dunlap:

... software on a computer or a network center, but now the scale that the cloud has afforded the software industry to be able to operate at. Then phase three, then moving as the smartphone world

came online after that, now you've got devices that can touch the cloud and move information to and from that cloud environment. You've got that cloud software down at the edge, even an edge that moves as people that operate seamlessly, again much like the fight that we find ourselves.

Mr. Preston C. Dunlap:

Phase four then, a little bit, I would say, to the surprise of the commercial industry, we've got software in the cloud and scale and devices, and then we found that the data could actually be in one place and accessible and so data scientists could begin to turn and understand patterns and influences at the data that they couldn't see before when it was locked inside smaller stovepipe chains. That was that fundamental key that then moved to we'll call it the last stage there for artificial intelligence and machine learning. That's all of a sudden the academic researchers that did machine learning algorithms that were largely relegated to textbooks and theory all of a sudden now had the capacity and the data to be able to apply those algorithms, and you began to see tremendous, both profit, but also tremendous capability to be brought to bear at large in companies like Facebook and Uber and Amazon, and the list goes on that we all know about.

Mr. Preston C. Dunlap:

That's, in some sense, the same growth path that the Space and the Air Force are on. We have the advantage here and the opportunity to be able to take and borrow that, and then apply the military-specific needs on top of that same approach. To that end then, we've developed an architecture that enables that pathway to happen and to be able to take the tremendous exquisite and capable nodes or platforms that we have, be they trucks or submarines or ships or ground stations or aircraft, satellites, and then to be able to not only do more of them and more capable of them, and we need to do that, but that fundamental change that the National Defense Strategy requires is to not only do more and better, but actually to [inaudible 00:26:12] the power of that integration, like one team is the objective.

Mr. Preston C. Dunlap:

The focus for the part of the Air Force on the JADC2 from a technical perspective is that integration of sensors and the integration of those effects, be they kinetic or other ones. We've got a pathway then that then connects, or a connectivity pathway through multiple approaches that then connects those sensors, decision makers, and effects, and then there's a fundamental shift where instead of having one platform do the sense and shoot, we'll still do that, and then we've moved to the one platform, so do a sense, and then another take some kind of a effect, so now a many-to-many relationship, and to do that requires a shifting of the data to turn it into information.

Mr. Preston C. Dunlap:

Our two chiefs have recently called in an op ed data that currency of modern warfare, and why they say that is that we've got to empower that data so that it's useful to the decision maker and it moves at machine speeds. That means secure processing from one class all the way to high classification is needed, and so we have a concept for global cloud access globally wherever you need it whenever you need it, but then also edge, so at the edge, whether that's on a Humvee or in a tent or in a large brick and mortar facility doing some kind of operational tactical work.

Mr. Preston C. Dunlap:

The ability to get access to the data and information that you need and ride that data and ride those applications just like outside the Pentagon now inside to be able to enable the warfighters and all

domains to be able to operate and use the information that they need where they need it rather than having to go somewhere or be in front of some particular thing to be able to achieve the mission that they need, really freeing up the warfighter to do command and control, battle management in a way that they have been able to do in their private lives, but very hamstrung in being able to do when they come to work and do their mission.

Mr. Preston C. Dunlap:

Effectively, what we're talking about is moving the Department of the Air Force from a flip phone department to a smartphone department, and that's where we're headed. We've got tremendous opportunity to borrow and augment those commercial capabilities and partner with traditional platform developers for the defense department to be able to integrate those capabilities.

Mr. Preston C. Dunlap:

The third thing, we've got this imperative to creativity and speed. To that end, then we don't just need the right technology, but we need to go about it in an agile and smart and fast manner. To that end, every four months, the Department of the Air Force in partnership with the Joint community are doing what we call on-ramps. Think of that as a mixture of test development, an operational exercise alongside a four-star combatant commander or more that sets an operational challenge in front of the team, and then test to see how well all the product lines that are getting developed operate and face in actual warfighting challenge, both from sense all the way to the effect, the entire kill chain or kill web or decision web being exercised, not just one technology or another.

Mr. Preston C. Dunlap:

It's a fundamental shift in the way we normally do the approaches from an integration perspective, but not unlike the way the outside world thinks about it. That first event happened in December in only four months. The team should be very proud of themselves. They did at least four things that happened for us for the first time, the ability to communicate across some fifth-generation platforms that couldn't talk before, the injection of a low-Earth orbiting, Proliferated LEO, satellite constellation, and be able to use that over a secure manner to move data back and forth across military capabilities, and movement for the first time of that command and control machine and machine capability over a cloud-based environment and architecture, and finally, number four, the ability to continue a common operating picture outside of the facility and move very seamlessly out to the field.

Mr. Preston C. Dunlap:

The team intended to do another one of those on-ramps as they do every four months in April, but when COVID hit, the team didn't sit on the hand, so to speak, but actually recognize the problem and saw that if Joint All-Domain Command & Control is intended to do command and control in a seamless disaggregated disruptive type of environment, that actually isn't too dissimilar from the COVID situation where we all have to maintain social distancing separation, and then we have troops in contact, so to speak, at places like the Javits Center in New York City.

Mr. Preston C. Dunlap:

The team's been rapidly deploying a current ops real-world on-ramp, so to speak, delivering devices to the edge to provide health workers with the ability to have situational awareness on where they are, what their health status is. We've also been deploying the ability to have a deviceONE laptops to maintain classified processing at the secret level while the device itself is unclassified when not being

used to moderate the security risk posture. Just examples like that, a phenomenal creativity and ingenuity to be able to push things out, not just for the future of war fight, but literally to today saving lives and helping folks.

Mr. Preston C. Dunlap:

Then they're going to continue that every four months, and upcoming here in August and September will be the next on-ramp, where we will have Space Command, which is a new... last year, combatant command will be the supported commander for the first time. Then we'll be moving the apparatus out to the Pacific in partnership with Admiral Davidson and a continued partnership with John Raymond at Space Command as the third Advanced Battle Management and Joint All-Domain Command & Control field exercise or on-ramp, so to speak.

Mr. Preston C. Dunlap:

Very excited about what the team has been doing in collaboration with the entire department, with all the services contributing and doing their own capabilities that nest within the Joint staff, and DoD led all the main command and control activity. Let me just end by saying that I think, number one, I think we do have tremendous challenges that are posed by the National Defense Strategy, but it's clear. Number two, we have tremendous opportunity that's at our fingertips if we choose to walk into them, and we continue to pursue those very vigorously, and number three, I'm confident that with the folks you got here on the panel, the broader Department of Defense, Missile Defense Agency, and the other services, that we've got know-how, the wherewithal, and the drive to get this done.

Mr. Preston C. Dunlap:

Very excited. I literally just got off of another VTC with over a thousand folks from industry, small businesses, large businesses, traditional defense, nontraditional capabilities where they're all in the Industry Day was trying to get after and solve these challenges very rapidly. I think we've got a clear challenge and a clear imperative. We got the right team, and excited to see and watch from where I sit in the chief architect role to be able to watch this unfold with the mastery of the capabilities and the drive and the leadership that we have at our behest. Thank you for the opportunity to provide some comments.

Mr. Riki Ellison:

Thank you, Preston. Just one question here. Your vision, are you ahead or on par with what Silicon Valley Google knows guys are doing, and there are obviously limits with our military acquisition process. How do you see that, and how do we increase the speed of the... what are commercial industries doing, what your vision is to make this thing be as seamless as what the commercial guys are doing and to be up to date and up to speed?

Mr. Preston C. Dunlap:

Yeah, there's... My personal view would be that I doubt it could probably be sort of objected to, but they and others are ahead. The change and shift from development and capabilities and research and development from the Department of Defense being the primary research and development engine in these areas to the commercial world, being the primary development and engine, we've got to recognize with open eyes. The last 20 years in particular have just exploded in these capabilities, some of which I was involved in, in the tech startup world as well as back in the Hopkins days.

Mr. Preston C. Dunlap:

I've watched it from inside and outside happen. The great opportunity is that we have to be able to harness that in a way that doesn't take us 20 years to get here because we can lift from the... and ride the wave, essentially, that these companies have been able to afford us and the modularity of the approach that the department is taking to be able to build all the roughly, in detail, 30 product lines like Lego blocks held together by digital engineering and standards and dev ops-like software to be able to enable the capabilities to snap together and reform at speed.

Mr. Preston C. Dunlap:

From an industry perspective, that's why I'm very excited with just the large number both in the first Industry Day and this one of companies, some of which you named that are very excited and are helping prototype some of the capabilities, both with the COVID fight as well as for the longterm. We've got to have a little bit of humility here and listen and learn, and then also adopt, and then apply the sauce on top of that that makes it particularly useful and important for the military environment that we're going to face.

Mr. Riki Ellison:

Thank you, Preston. Our next speaker is the Cross Functional Team lead for JADC2 for the US Air Force, Brigadier General David Kumashiro.

Brig. Gen. David J. Kumashiro:

Thanks, Riki. Very much appreciate you and MDAA hosting this under Secretary of Defense Rood. Again, thank you very much for your participation, and to really the entire team that's out there taking the time to really understand the challenges of this problem set that are facing, not just the Air Force, not just the Space Force, but also the entire Joint Force. Another thanks to the MDA team. Obviously, we share this problem set, particularly as we look at Homeland Defense and all of the challenges facing that where our adversaries have come. I'll use that as a starting point to link what General Fantini had started with in terms of the strategic challenge that we face, and then link quickly to the tech piece, and then how, as I, from the JADC2 Cross Functional Team lead, we're really trying to get at this problem set.

Brig. Gen. David J. Kumashiro:

Obviously, where our adversaries have come with terms of their technologies and their capabilities really had put us in a bit of a bind. That bind has a really limited our ability to maintain decision advantage in the manner that we would like to. One of the, obviously, the strategic and the operational challenge for achieving that decision advantage requires that we really harness and leverage where the commercial sector is, where industry is, where tech is in terms of the ability to connect all of our sensors and our shooters and our platforms together, really, to achieve machine speed, the ability to move data, to move information, and capture it in a way that our warfighters can make sense of that and that our decision makers can then make decisions, and then, again, at the tactical edge, we can deliver some, some type of effect.

Brig. Gen. David J. Kumashiro:

That's the one challenge that strategic and operational, the limitations that we now have against our adversaries, but again, as I think Preston really articulated very, very well, the challenge that we have as a department in terms of our own digital transformation and our modernization, and so that's where our link between JADC2, the Advanced Battle Management family of systems comes into play.

Brig. Gen. David J. Kumashiro:

From the Air Force perspective, just particularly, we can't really say enough about the leadership that General Goldfein, our chief of staff of the Air Force back in 2016 when he laid the ground work for multi-domain command and control and the priority of that, not just for the Air Force, then the air force, but now the Air Force and the Space Force, but really also the Joint Force and from that had stood up a team of senior leaders that really grappled and wrestled with this problem and how best to approach it.

Brig. Gen. David J. Kumashiro:

They really distilled it into three different lines of effort that I and a larger are focused on, which is really developing those operational concepts, those tactics, techniques, and procedures and the doctrine that our warfighters need to execute in this highly-contested environment. Simultaneously, we also knew that we needed to develop the advanced technologies that support this framework, support the operational concepts, and really thus was born the Advanced Battle Management family of systems that Preston had discussed. Last line of effort focused on how we then operationalized these technologies and get it in the hands of the warfighters at the pace and scale that they need really to remain relevant against our adversaries.

Brig. Gen. David J. Kumashiro:

Those concepts, the advanced technologies, and the ability to operationalize and ensure that our warfighters are ready to take on this fight with our adversaries, the synchronization of all of these three things together is really, I think, one of the big challenges we face. If I could be so bold on the question that you had asked, General Fantini, I think that really is the biggest challenge that we face. It's the synchronization of all three of those elements and getting the larger department to move in a direction that really leverages the speed at which technology is developing and changing how we look at developing those concepts and ensuring those tactics, techniques, and procedures and concepts are agile and that we can rapidly then field it and get it into the hands of our warfighters.

Brig. Gen. David J. Kumashiro:

If I could also be so bold, I think one of the challenges we face is this gap, this difference, I think, between where our warfighters have always stood and really where technologists stand today. I think I've discussed them with many online this concept of this nexus of the warfighter and the technologists. Strangely enough, I don't know if on YouTube you actually see this, but here you have Preston side by side with General Fantini, so again, this combination and this understanding and the synchronization of the warfighter and the technologists, the warfighting concept and the technology. If I could equate it more simply maybe to something that many of us are familiar with, I would say that literally every Captain Kirk needs their Spock. They need that person to help them understand and translate the technology and to help them make really, really good decisions in this very, very challenging environment.

Brig. Gen. David J. Kumashiro:

I will end with just saying, to take some words that Preston said at the end of his comments, there is incredible, incredible opportunity in the environment that we're currently in, and as many challenges as we a country, as a world really face with dealing with something like COVID-19, there can be no doubt that there's a tremendous opportunity to leverage that and to move the department forward, not just the Department of the Air Force, but also the Department of the Defense, and really, the federal

government and understanding where we need to go with the digital transformation and digital modernization.

Brig. Gen. David J. Kumashiro:

General Fantini had mentioned he'll be retiring shortly, and then I will actually be retiring shortly thereafter. If it could be any indication of how strongly I feel about this is if I were coming into the Air Force or into the Space Force today, I would hitch my wagon to ABMS and the approach that ABMS is taking towards technology and towards the capabilities that our warfighter needs. With that, I'll, going to end my comments, and then I'll turn it back over to you, Riki. Thanks again for the opportunity.

Mr. Riki Ellison:

Thank you, Kumo. Could you clarify, because we know the Navy has the CEC, which is a cross domain C2 system the Army's developing for strong IBCS system. How does that fit into the ABMS and the bigger wider systems of Navy architecture, possibly convergence project with the army? How do they all fit to ABMS?

Brig. Gen. David J. Kumashiro:

That's a great question, and I'll turn it a little bit of a different way. As I have spent the last year in this space, in this battle space working in JADC2 alongside Preston and Major General Fantini, the two things that there's really no question about is the imperative from a National Defense Strategy perspective, and really, the approach that we are all collectively taking to get there.

Brig. Gen. David J. Kumashiro:

This has to do with the data, the secure processing, the connectivity, building the apps that our warfighters need to connect the Joint Force. There is no discussion or no debate about those priorities. It really is about, really, the how we're going to get there. When you look at IBCS and when you look at CEC and some of the other service systems that are out there, ABMS is an approach. It's an approach to build out the connective tissue.

Brig. Gen. David J. Kumashiro:

Take the Army and the Navy and the Marine Corps and the Space... I'm sorry... the Marine Corps aside for justice a second. ABMS is what the Air Force and the Space Force need to be able to connect in the 21st century and then to connect with the Joint Force. With ABMS and developing all... It's a system of systems, a family of systems that we will then be able to connect with IBCS, we'll be able to connect with the Naval Tactical Grid to ensure that that data flows, the information flows at machine speed so that we can maintain decision advantage over adversaries.

Brig. Gen. David J. Kumashiro:

I say that in the sense in terms of there is no, I think, debate about the approach that ABMS is taking in terms of what we're focused on, again, developing out that environment that Preston so articulately spelled out for us. But I think it's just about how you get there and just ensuring that the systems that they have in place that we definitely don't want to orphan those systems out. They're part... Obviously, as a collective, that is the Joint Force, and so our goal is, again, to connect with the Joint Force.

Mr. Riki Ellison:

Thank you, Kumo. Appreciate it.

Maj. Gen. Michael A. Fantini:

Riki, Mike Fantini. Let me... I want to make one thing really clear on your question. Your question was, how does CEC or IBCS connect in to ABMS. That denotes a prescription that ABMS would be prescribed something that other services. What Kumo was really identifying is the ability to connect with. You have... and we sat down around a big old table with a Vice Admiral Kilby, General Smith, with Lieutenant General Richardson, Lieutenant General Wesley, and army reps in the building as well have this conversation about there's elements of the foundational pieces or attributes we think we needed, centers around the data and centers around interfaces and the connectivity and some element of standardization, but it's about doing this. It's not about doing this. It's not [inaudible 00:46:38] inclusive in terms of being able to interface and connect with others.

Mr. Riki Ellison:

Thanks, Mike, for that clarity on that wording on that. Absolutely. I was thinking too that those are tactical systems and that was more strategic. Maybe I'm off on that. That was where I was framing it. It is a team game. There's no question you've got to play together with everybody.

Brig. Gen. David J. Kumashiro:

Riki, if I could just also very quickly add, obviously, each of the services have made significant investments trying to get at this JADC2 problem set. With that being said, each of the services have different platforms and different tactical edge devices that they need to ensure can link to the larger collective, which is, again, this Joint environment, JADC2. AMBS is... The Department of the Air Force can ill afford to fund all of those efforts across the Joint Force, and so that's why-

PART 2 OF 4 ENDS [00:48:04]

Brig. Gen. David J. Kumashiro:

... those efforts across the Joint Force. That's why, again, in terms of wanting to give reassurances to folks that it's not, I know it sometimes may come across as a little bit of a hostile takeover, but I think as General Fantini had mentioned, it's really about connecting with those systems and making sure that the data flows down to the tactical edge using those Army systems, those Army investments, the Navy investments, the Marine Corps investments, et cetera.

Mr. Riki Ellison:

That's what you were talking about, connecting the NEC2 mode. I would assume that was the fit on how are you going to play that with any sensor or any effector with their effectors and their sensors in that group as an enhancer for everybody to be forced multiplier for what you've got together instead of individually. That's where we have to go to compete and hold our status quo.

Mr. Riki Ellison:

All right. Thank you. Our next speaker, we're bringing in the Missile Defense Agency. John Bier is the program director of their Command and Control Battle Management System, the GMD system. He's been there quite a while. His team has achieved remarkable results in doing a specific mission tying in

the joint capabilities and cross-domain capabilities to give us the best defense that we have today in defending our country against ballistic missiles. John, it's all yours.

Mr. John Bier:

Hey, Riki. Thank you. Thanks for that introduction and to the three previous speakers that are right on where we need to go in the future with regards to integrating among the services, integrating not only our legacy platforms, but future platforms as they're coming online. Riki you hosted back in November an anniversary for C2BMC, 15 years of operations. Really, it's been 15 years of integration. We look at C2BMC as the integrating element for missile defense.

Mr. John Bier:

We've been integrating over those years, whether it's been with Aegis multi-mission platforms, Patriot as a multi-mission platforms to the Air Force's early warning radars and space-based infrared systems to where we can tie together both the missile warning community and the missile defense community. Now as we go further with the standup of Space Force, and we'll be as now supporting SPACECOM in order to dominate in space. That data is important. It's important to make sure we integrate it together, make sure [inaudible 00:50:53] to platforms and that data is distributed in a timely manner for those integrated fights.

Mr. John Bier:

When you think about what MDA has done over the years, it's done it really through brute force. We will stand up in a stance to fear. We'll talk about our future architecture, but our prior chief architects for missile defense said, "Hey, we want to be able to have this capability with these sensors to do this particular mission." It's been through brute force.

Mr. John Bier:

Where you look at where JADC2 is trying to draw the C2 community and the ABMS program is how do you make that easier? How do you make it open up more and more standards? That's key there because over the past 15 years, we've probably had about seven different [inaudible 00:51:46] portions of C2 [inaudible 00:51:48] fielding across 18 time zones to include space now and to support multiple AORs. It's that thoroughness and engineering discipline that we have done over the years, but it's taken time.

Mr. John Bier:

We're on spirals now that usually are running about two to three years. We want to do that faster in the future. We're going to more and more of an open standards like industry has done today in the commercial world, it will allow us to integrate newer platforms faster. The Air Force has started up that work through the ABMS program. We'll follow along because we don't care. We'll take anybody's sensors as long as it contributes to the missile warning, missile defense and the space domain environment. That's key there.

Mr. John Bier:

While we're working these new standards and new environments, these on-ramp exercises that Preston and Kumo talked about earlier are great integration environments. That sort of brings back to the legacy of why MDA has been so successful is because of our use of our Missile Defense Integrations & Operations Center out there at Schriever Air Force Base where we allow the tech guys to try new algorithms, try new sensors and see what's the contribution of [inaudible 00:53:22] distribution.

Mr. John Bier:

It's these on-ramps that will be key in demonstrating new capability and determining what works and what fails. I mean, a lot of our tests you have failures and that's okay to fail, but you should know where to shift your resources and be getting after that common problem. You guys talked about earlier with some of the newer platforms that are coming on the Navy with the CEC and the Army with IBCS, and yes, we'll be integrating with those platforms as with both of them. IBCS today is connected with C2MBC in our test environments. As they mature and go through their operational testing and evaluation, and when they field, we have confidence that we can connect those two systems together and support the continued missile defense capabilities with the Army.

Mr. John Bier:

We're all excited here at MDA. I'm going to hand over this to a Stan Stafira next. But he'll talk about where MDA is going with beyond just missile defense, as we have some the responsibilities for both cruise missile defense and hypersonic defense, but it's great to be part of this team and be part of that future Command and Control System as we continue to break ground in this agile environment. Thank you, Riki.

Mr. Riki Ellison:

Thank you, John. Just one question, what would be the best practices that you've seen, and it looks like a next integration of the hypersonic space layer is going to fit into your C2BMC with the Air Forces fit with them on that ABMS. What do you see from your point as being a purple joint person that's done very well with it on how best to do this or your best practices on going forward with that integration?

Mr. John Bier:

Right. To Riki, you are talking to me about the hypersonic and ballistic tracking system, which will be a sensor that will reside on the future Leo constellation that the Space Development Agency is working on. There again as we get more and more proliferated sensors up there in space, we want to close those gaps. Because I mean, there's not enough land and enough to cover the globe that we want to with radar. We got to go to space. We have to expand our space-sensing capability.

Mr. John Bier:

Then you've got to be able to tie that all together and integrate it and correlate it. That's again, another multi-purpose platform that as we've relied on these new space satellites with multiple sensors, but had that ability to share that sensor's data and whether it's at the edge, as General Kumashiro brought up, or is it do we bring it back for centralized processing? We'll go through those trades in the future, but we've got to close the gaps that we have out there today with our overheads and our land-based radars, over.

Mr. Riki Ellison:

Thank you, John. Thank you. I appreciate it. Our next speaker is Stan Stafira. He is the single point for MDA to the war fighter on all engineering aspects of the BMD system. Stan, it's all yours.

Mr. Stan Stafira, Jr.:

Thank you, Riki. I appreciate the invite to speak today. I feel honored to be on such a big panel with General Fantini, Kumashiro, [inaudible 00:57:19]. I feel great to be able to talk to you about what's going

on as far as the architecture in MDA. [I've been in this 00:09:28] job about 11 months ago at the BMDS on [inaudible 00:57:32] day. About four months in, we reordered MDA to a 2.0 organization, or as Admiral Hill would call it, making me the chief architect of the missile defense. [inaudible 00:57:47] I needed to kind of sit down and figure out where are we at and where do we need to go?

**Mr. Stan Stafira, Jr.:**

We've had our architecture in the past looking at that rogue threat. The rogue threat's advancing a lot more rapidly in the near term than it has been in the past and it has been challenging our architectures. We kind of sit back and try to think about what do we need to do? Where do we need to go and how do we need a lot of capability to be able to get to that, that future architecture that's agile, omnidirectional and deters, denies and defeats all these future threats that were coming against.

**Mr. Stan Stafira, Jr.:**

We wanted to try to do is update our strategic vision and future roadmap to figure out where we need to go in the agency with our service partners, our war fighters, as well as our allies and friends as we go out to 2035, looking at 2035 and beyond at where we need to go with this architecture. What we did is we kind of sat back and looked at it and said, "What are the characteristics of this architecture?" The current architecture is good for what it does and it looks at a ballistic threat, but now we're looking at hypersonic. We're looking at a cruise missile threats to the homeland. We're looking at ballistic missile threats as well. What do we need to do in the architecture as we move out into the future, a 2.0 architecture, as we move out into the future?

**Mr. Stan Stafira, Jr.:**

We had about 10 characteristics that we thought that this architecture needed to really address as we go out. That's what we're looking at. As we develop the architectures, we're incorporating those capabilities. One of the main big capabilities, and we've been talking about it today, is that Joint All-Domain Command and Control. We need to have that ability to be able to pass that around, get it to the warfighters, get that capability out there so that we can actually do that mission. We need the ability to globally see, track and engage these threats in a multi-spectral environment in realtime with persistent capabilities so that we can provide the right data to the right targets at right interceptors.

**Mr. Stan Stafira, Jr.:**

As we go forward, we also want to be able to have the ability to challenge the threat in all phases of flight, terminal, boost, mid-course. We want to make sure that we'd be able to cover that threat spectrum as we are there. We want to impose our will on him, not give him any places that he can hide or be able to do things that we can't see. We want to make sure that we can be able to do that throughout that entire threat trajectory, challenge him the whole way.

**Mr. Stan Stafira, Jr.:**

As we look at this, we're looking at an architecture that's flexible, agile, resilient, all those factors that we're talking about in the JADC2, or the Joint All-Domain Command and Control, that we need there. We need that in this architecture as well. We need to leverage that Joint All-Domain Command and Control to be able to do this to what we need to do in the future. Incorporating cyber defenses, making sure our defenses are layered, making sure that we have the ability to transition capability between different regimes so that we have a more robust defense as we look into the future as well as optimizing our resources.

Mr. Stan Stafira, Jr.:

As it was mentioned, there's not a whole ton of money out there just to do this. We need to optimize our resources to make sure that we're optimizing our capability to engage the threat, as well as optimizing where we're attacking in the architecture. What are those key pieces that we need to look at and then integrating what our global partners are doing and integrating rights through left of launch. All those are the characteristics we think we need to include in this higher-level architecture, which in the end basically enables the right sensor to communicate with the right shooter at the right time. That's really what we want to get down to be able to do that and uses all the main command system as a way to end.

Mr. Stan Stafira, Jr.:

I think that's really where I'm coming from as far as the architect goes to the agency is what we want to design. In the past, we've looked at a ballistic architecture. There could be a hypersonic architecture. It could be a homeland cruise missile defense architecture, what are the capabilities that cut across three areas? Those are the key areas that we need to focus on and be able to bring out in the architecture and invest in so that we gain the most bang for the buck as we try to attack all these threats at the same time. That's what we are looking for in the architecture that the agency is looking at it in the future.

Mr. Stan Stafira, Jr.:

I guess I'll end right there with that's the kind of current view of our architecture, the way we're going forward. As we develop new increments of the architecture, there's lots of sub architectures associated with that we're starting to develop and look at, but these characteristics are what's guiding it. The Joint All-Domain Command and Control I think is going to be key for us to be able to achieve that vision as we look out in the future.

Mr. Riki Ellison:

Thank you, Stan. Just a tremendous challenge you have, but it's great to see the acceptance of bringing those other layers and depth into your architecture. As we grew up with this way back when, when it was an assistant [essential] design just for ballistic missiles and now you're moving into the big thought process and leveraging that into the JADC2, which I think I'd like to see. Mike might comment on it because that's the offensive operations and where we go possibly left the launch as well as right of launch that's beyond your architecture and how that JADC2 fits for that, the best deter[rrence] are regional opponents and so forth on that.

Mr. Riki Ellison:

One thing, just touch base, because you work with our allies the best. You've done a great job in developing systems with them. How does the integrated efficient of our allies in this kind of thing, how do we fit them into to ease some of our burden both on capabilities and capacity around the world? You seem to have been the lead with some of this MDA has done a great job across a multitude of allies and in these systems. Can you comment on that quickly?

Mr. Stan Stafira, Jr.:

Certainly. We have done a lot of work with our allies analyzing ballistic missile defense facilities, getting them to understand what capabilities are out there, what they can provide, where they can provide capability into the system. There's a great desire among some of our allies to be able to provide that capability and be able to ... what niche can they provide as far as we go out into the future?

Mr. Stan Stafira, Jr.:

One of the things we're going to need to understand better is as they provide that capability, how do we better integrate it into the system? How do we gracefully degrade where there might be a US asset there with another foreign asset, if they're co-located together, which capability do we use? If there's no other assets there, how do we use the allied asset, bring that data in to be able to have a more robust picture, a more resilient picture, and make sure that architecture can handle those multitude of threats that we see in the future and be able to leverage the capability.

Mr. Stan Stafira, Jr.:

Because we were in a [fighting 01:05:52] coalition, we know we're going to fight it in a coalition, how do we bring those guys in and how do we do it better? We're working on that as we work with all our allies out in the future.

Mr. Riki Ellison:

Thank you, Stan. Thank you. I want to turn this over now to my fellow board member and the former Under Secretary who started the discussion after the presentation. The presentations were great. Thank you guys for all contributing those remarks. John.

Mr. John Rood:

H, everybody. It's John Rood speaking. Again, congratulations to the presenters. Nicely done to give a good overview. As we've been talking during this webcast, quite a few questions have come in from folks watching. I wanted to first turn to one of the questions we received. Actually, it was the first one that we got from our YouTube audience. The question is, "The presenters have discussed the overall efforts to merge C2 systems and [inaudible 01:06:57] joint [inaudible 01:06:59] all [inaudible 00:01:07:00]?" The question was, "How far are we from implementation of JADC2? How will C2BMC and the other mission command systems in the services realistically adapt and over what timeframe?" They're asking about the schedule and what they should look for. Perhaps Major General Fantini, would you mind beginning to answer that question? Then we'll ask some of our other presenters to address it?

Maj. Gen. Michael A. Fantini:

Yeah. Thanks former Under Secretary Rood. I think we're in kindergarten in my humble opinion. We are at the first initial steps of bringing this together, which is one of the challenges that maybe I should have identified Riki to your, it would have been my third challenges. Folks believe this is going to happen tomorrow because we're talking about iterating and going fast. The reality is it's going to happen over a number of years, but we've got to take these first steps. This ability to maintain agility, which has been nonexistent, not nonexistent, but it's been very challenging for the department to realize in any number of programs.

Maj. Gen. Michael A. Fantini:

I think that is one of the things that it's not going to happen overnight, because there are any number of things that already exist that we need to take in account for, because we have investments there. The question is how do we create the interfaces to what has already been invested in and then how do we make them connect into this greater holistic piece? This is a journey. Any sensor to any shooter in my mind, that's the vision. As Stan pointed out, it's the appropriate sensor or the right sensor to the correct shooter at the right time, right? Then we get into these details of how it's going to move into the future.

Maj. Gen. Michael A. Fantini:

But that's why there's a couple of things under the auspices of the Department of Defense Joint All-Domain Command and Command Cross-Functional Team that's run effectively by the J6 and the J7, they are shepherding the joint warfighting concept who is also trying to align all of the different types of activities of exercises, experimentation and prototyping across the department that we in the Air Force are trying to help synchronize to understand what's going to be learned, what do we think we're testing out and what is being created so that we can communicate that across the broader good?

Maj. Gen. Michael A. Fantini:

Under the Joint Concept for Command and Control, the Air Force has the lead to try and help pin that together if you will. That activity is kind of just getting off of the ground over the last few months, but that's envisioned to be able to create this ability to communicate across what is the Navy doing? What's the Marine Corps doing? What's the Army doing? What's MDA doing? What's STRATCOM doing about nuclear command and control, right?

Maj. Gen. Michael A. Fantini:

There's this element of solving world hunger that I acknowledge up front, but we need to understand what does progress look like? How do we get to this agile mindset developing requirements that allow us to maintain the ability to lift and shift quickly so that we can incorporate things that are providing value, which is kind of what Stan indicated. Where's the value? Where are these things overlapping so that we can get the characteristics that enable the Joint Force? With that, I hope I answered that question.

Mr. John Bier:

Riki, John Bier here. As the General mentioned, we were integrating with the [inaudible 01:11:19] as part of the OnRamp II as part of the April OnRamp, which was postponed. We'll determine through this early integration into our laboratories where that value was demonstrated. Then we'll determine where do we put that and integrate it into future systems.

Mr. John Bier:

As General Fantini was saying, it will take a few years, but we're working standards now that will be for ease in future connectivity and integration among multiple platforms. It's that environment. It's get into the early testing with the experimental laboratories among all the programs.

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Mr. John Bier:

... [inaudible 01:12:00] with the experimental laboratories among all the programs that will give us the most return on our investments.

Mr. Riki Ellison:

Thanks, John.

Mr. John Rood:

Thank you both for the responses to that question. I guess one follow on question I would have is, John Bier, you correctly talked about the BMC [inaudible 01:12:24] linking missile defense sensors and shooters over 18 times zones, including space, really the most stressing, I think mission area where we've connected a worldwide force like that. Perhaps even more so than the nuclear command and control because of the time periods involved and the degree of precision. Although the nuclear C2 enterprise's certainly quite capable. But when you look at that vision, one of the things that made it possible for you at MDA to do that is that people were in positions like yours. And there was an architect that could require the systems operated by the Army, the Navy, the Air Force to adhere to certain standards.

Mr. John Rood:

It's similar to all of us have cell phones, whether it's Apple or Samsung, there are certain operating systems standards that the system administrators require people to adapt to. And when there were updates, others in industry have to adapt to that. But I guess one of the questions I would have is that for this vision to work, to integrate the joint force. While I think Fantini put it very well, [inaudible 01:13:36] scripted in the role that the Air Force has without someone having a lead role that has a little bit of ability to be that systems architect, I wonder if you're not going to end up with, so five situations again and miss out on the goodness of truly integrating the joint force.

Mr. John Rood:

So I mean that kind of organizational architecture, it seems to me is critical. Would you be able to comment on that a little bit? Maybe start with John Bier with the lessons you learned from the missile defense experience and perhaps our Air Force colleagues and could follow on and say, well, how might that be applied in a way they will get buy in, but still give someone the ability to guide the architecture development?

Mr. John Bier:

Yeah, I'll start off John, but you go back to 2002, when Secretary of Defense Rumsfeld stood up missile defense and gave the authority for missile defense to really, to be its own, have its own engineering capability, the authorities that were granted to the director of the Missile Defense Agency to be responsible for his architect, be responsible for his contracting authority, be responsible for his evaluation in partnership with the operational community and so forth. That foundation to me is what allowed the success of missile defense and how we started with our initial capability in 2005 and to where we are today as a global defensive system addressing not only regional, but a Homeland defense and that governance that he instilled granted today with through the MDA charters was very fundamental in the cornerstone of the success and the ability for MDA to turn quick and make changes in the architecture.

Mr. John Bier:

Now, we're bringing more as part of our oversight with the MDEB and DMAG, that oversight still, again, we're not off our own going rogue, but the ability for the director to take a problem, solve it with his own resources and deploy a capability is paramount. And how I think AVMS is going to have to look at in the future. But that JADC2 environment allows us to bring in the multiple services along with MDA in the intelligence community and discuss these issues.

Maj. Gen. Michael A. Fantini:

Secretary Rood, if I could jump in, it's Mike Fantini. So I would say that the department has identified the joint, all domain command and control across functional team that's co-led by the J6 and the DOD CIO is exactly trying to do that work, but it's also a combination of that level of oversight and establishing the appropriate standards and architectures, but we also need to make sure that we balance that out with the appropriate ability to move fast and I would offer that. So the services are not charging ahead blindly, there's an effort within the department at that level to have kind of a traffic cop. And I've been told General Hyten wants to be driving this from a JROC perspective and have a lot of visibility and understanding of what that is.

Mr. Preston C. Dunlap:

Hey, this is Preston Dunlap. I like to just augment that too. I think there's the standards push to sort of play into the system that is sometimes important, but I don't want anybody to be lost on the incentive to pull. So think like it wasn't too long ago that Apple, for example, only allowed the music in their iTunes system to only be able to play on Apple devices. They thought that was a good idea. It was an organic system, brought it into the ecosystem, yet at some point they decided that, okay, well, let's just allow that music to be able to play it on a bunch of different devices. Now, then all of a sudden their profit actually went up because now they're not only selling to Apple customers, but customers that use all kinds of different capabilities.

Mr. Preston C. Dunlap:

Now, we don't have a profitability sort of metric as the US government, but we have a performance metric. So what you can do in addition to sort of working to enforcing and standards, like the General Fantini mentioned with the joint staff and the chief information officer in DOD, you do that, but also if you're able to bring... if you're the Army or the Navy, the Air Force or Space Force, and you can be able to pull from or push to information that you didn't have before, there's an incentivization there inherent in the system to be able to want to both provide and pull your information because you're able to do your job more effectively. It's not a profit incentive, but it is a performance sensitive. So if you imagine yourself, it is like a brigade commander having access to what the national capabilities have, what the Navy seeing off the coast and so on.

Mr. Preston C. Dunlap:

That's a much more powerful and enabled operational commander, same thing with Space Force and the Air Force as well. So let's not lose the opportunity here, just like we see these forces at play in the commercial world about both the standard enforcement of front. Also, the growing standard development over time as capabilities work and grow together, and then learn as the standard grows and the capabilities grow. But also the incentives inherent in the structure to be able to actually do the mission more effectively. And I think probably nine times out of 10, you're going to find you're going to be doing that mission more effectively with the other information and partnerships than you are going it alone.

Mr. John Rood:

And General Fantini, a follow on question. Preston, you talked about the commercial world and creating the right incentives. It keyed in my head that this week there was an op-ed by a group of venture capitalists and people such as former directors of the defense innovation unit in which they were talking about the barriers to the defense department, leveraging the goodness of the commercial world. And

their basic point was we need to move beyond the ability to do rapid demonstrations of capabilities and experiments. And they say, well, that works well with the department, it's not followed on by rapid agile acquisition then of the capability that is demonstrated in the same way it is in the commercial world.

Mr. John Rood:

And so they were saying stop with simply experimentation, but show us the roadmap that leads to rapid acquisition. Then once a capability is demonstrated and the system to make it easier for us to do business with the defense department. I wonder if you could, you talked about the on-ramps and it seems to me then that part of what they were referring to is the challenge would be once a capability is demonstrated in the on-ramp, how does it truly on-ramp into the force-

Maj. Gen. Michael A. Fantini:

Yes, sir.

Mr. John Rood:

... in a way as General Fantini talked about that is agile?

Maj. Gen. Michael A. Fantini:

I mean, this is all about change and it's all about transition and it can become maddening, which we know. So change is hard, that's checkbox number one, got it. And that's where I talked earlier about this, you have these are various constituencies that are saying, "Oh yeah, we don't believe you can do it, prove it." And so that's exactly what we need to do. And so in the on-ramp one that Preston talked about, we had four-star commanders putting their fingers in our chest, going, "If I had this tomorrow, I'd rather have this than the crap I put up with for 25 years." And so when a four-star sticks his finger in my chest, I pay attention. And so that's what we need to work on really hard is to demonstrate what does that look like?

Maj. Gen. Michael A. Fantini:

And so that's where some of the work that's going on with COVID recently has been able to accelerate how to make this more real. And that is our challenge in transitioning because our system is not incentivized to transition, our system is to continue to plot along with what we've agreed to the requirements perspective that delivers too late at the speed of irrelevance. So I want to hand off to Preston to talk about the acquisition aspects of that and some of the work that he's doing because this touches any number of acquisition executives and so it's the ultimate enterprise problem. Over, Preston, if you could illuminate there.

Mr. Preston C. Dunlap:

They're called on-ramps for exactly that reason and not demonstrations or experiments or tests, they're actually all that and exercises together. But the point, that's why we call them on-ramps, because we have to remember the point is actually on ramping real capability as fast as possible and eating the elephant one bite at a time. So the words that we're not used to hearing about on-ramps, that's actually the actual reason behind why we do that. So clearly the team has deployed and developed you hundreds of devices supporting the front in New York City that General Fantini just mentioned providing thousand devices to be able to provide classified processing and remote posture, making an experiment that was going to happen in April a real capability. Now, that can be used when needed and as needed.

Mr. Preston C. Dunlap:

From a structural acquisition perspective, we've pulled together what's called the integration execution team that cuts across all of our program executive offices in the Space Force, in the Air Force to work the seams across all of those. And why you'll see things like the upcoming AVMs on ramp, not just do sort of individual experiments, but again, report to, are we operating as a team we've got live fire, live fly, live orbit, life steam. It does make it a little more costly and a little more difficult. What you get out of that though is far less cost and for greater capability in the long run, because you're actually bringing the platforms that need to be using it, whether that's a tanker, a fifth generation fighter, a Navy destroyer, a missile defense radar, and they're actually playing in the activity, which is a bit of a fundamental difference between the normal test experiment phase, where you do each of those one off, and then you hope that it can get integrated over time.

Mr. Preston C. Dunlap:

Instead, bake that integration in from the very beginning and set up the contract structure, like the team's done a so that you work through a lot of the contract phase now, and then it's set up just like an IDA type approach where you can then move on capability very rapidly once you get past the first prototypes. You've got a business structure in place, you've got an operational DevOps environment for hardware and software in place. And then you got to get the right partners on board to go do that across the government and innovation piece. And you got those three things coming together. What's actually making these events not just on ramps in name, but on ramps in actuality.

Mr. Riki Ellison:

So we have a couple more minutes before we have to close the session. John wants you to ask one more question and then we'll wrap it up. And if anybody wants to stay on for a dialogue, we can continue, but we're going to leave it at 13:00.

Mr. John Rood:

Major General Fantini, you talked about some of the challenges with providing a common operational picture to platforms, and Preston, you also talked about the need for that greater integration. And it was discussed a little bit about how we work with non-US partners. And so one of the questions that we got from the audience was about allies. And the question is cloud solutions are developed today in a way that are US optimized, but what's the right way to think about how to have those cloud solutions also benefit our NATO allies and our Asian allies like Japan in a way that things such as their AWACS, their other airborne sensors, F-35, for example, where they are space-based platforms, terrestrial radars, and so on, can link in effectively?

Mr. John Rood:

It struck me that even though the challenge is awfully damn big to integrate across the defense department, services adding in the allies because we're going to be involved in coalition warfare adds yet another degree of complexity, but it's necessary. And can our panelists speak to that challenge and how we should approach that?

Maj. Gen. Michael A. Fantini:

Sure. I'll give a real quick, and then you can talk to the smarter folks on it that we've got to include allies and partners in the ground floor. We say that a lot, but it doesn't actually ever happen. And the fact that we're going to be dealing with systems we've already kind of invested in, we have to figure out how do

we pull that along, but I'm an advocate there. And all of our folks that are, they've heard about the joint automate command control concept, they want in on it. And I think we need to be arming our partners with effective capability. And so that also tees up the discussion of the balance between release ability, tech risk and exportability and those challenges. I think that's an area that we should take more risk i if we want to have a partner, that's going to be effective night one.

Maj. Gen. Michael A. Fantini:

And then secondly, technology. In the joint strike fighter program, we've heard about this multilevel security challenge for any number of years. And it's like the Kobayashi Maru to go fix that. I met a guy named Palmer Luckey, and I said, "Hey, can you do multilevel security?" He's like, "Oh, yeah, easy day. Here's how I would do it." Nipper super J weeks, blah, blah, blah. He kind of comes up with this funnel. This is how we do a technology wise. I had no idea who I was talking to. It turns out he's the father of Oculus, a gazillionaire. So we have the capability to do this technologically. We just have to be able to be willing to do it. Over.

Mr. Riki Ellison:

Thank you, Mike. Preston, did you want to say anything?

Mr. Preston C. Dunlap:

Well, one clear thing in the secure processing realm for us, but with cloud and Edge, there's a layer for the secret releasable in particular, which is the hook for the allies and partners. And there's an ongoing actually program that's operationally used with our regional combatant commander is called the Mission Partner Environment that today is being used by a significant number of allies and partners to be able to begin to share those network resources. It's not the end state, but it's the jumping off point to be able to then pull in to the network to make something that is already out there and working in some regards in different regions actually I feel. So it's very important to the system. I know it's important in the missile defense partners that we have on here as well. And it's an imperative in the entire architecture that we do that and then make it real from the start baked in, not bolted on.

Mr. Riki Ellison:

Thank you. Thank you, Preston. And just the last statement here. If we see a constricted defense budget, then it's going to come from getting our economy back to speed. Is this going to force this JADC2 to happen much more or will they just resist it and go into stove pipes? Because it seems that what's coming here and we've got to get over those individual system to go bigger because that's the only way to go to be a competitor and to keep our status quo to do that. That challenge there looks like it's coming hard and we've got to find a way to bridge this and to present this, so everybody wins out of this, out of this aspect that we're talking about as a one to one fight across our own services and our allies to make up because I don't think we're going to get the defense spending that we've had over the last decade.

Maj. Gen. Michael A. Fantini:

John, you got that?

Mr. Riki Ellison:

John, you want to... Yeah, John's got it. He's got it.

Maj. Gen. Michael A. Fantini:

Well.

Mr. John Bier:

Now, Riki, I see heading on for the other panelists that are on my screen here and we're going to have to. It's got to force more of this collaboration and joint architecting from the get go. There's no way we can say we can't do this in individual stove pipes. And as General Fantini said, there's got to be changed and it's through the leadership that has to make these changes. Over.

Mr. Riki Ellison:

All right. And, the Secretary of Defense, is that the DOD, is that the president that's going to say, hey, we can't spend this, we got to work together and force it together? That's the overall architect that you've got to have or somebody just like you said, Rumsfeld did in 2002, where is that? Where are we with that? Is it going to take our time, maybe continue to decline time and take advantage of things for us to make that somebody to lead this thing and force it?

Mr. John Bier:

I mean, the leadership is already was saying that over the last couple of years before COVID-19, we needed a better integration, collaboration between all parties in the world of command and control. And that we can't afford all one system for every services and so forth. So I think pre COVID, the instructions were there for us to go follow in our national defense policies.

Mr. Riki Ellison:

So you can't stop what's coming. It's coming because you can't stop it. It is what it looks like and it's going to be painful for some, not so painful for others, but it's coming. There's no way we're going to sit back and get beat, we're not, I don't think we're going to do that. John, I want to thank each one of you for contributing, taking your time just to discuss this and open communicate this because it is a complex area. There's a lot of miscommunication with it. So thank you all of you for contributing. I do want to leave my board member to closing remarks, John, why don't you give us closing remarks for everyone, but it was a great session. Thank you very much.

Mr. John Rood:

Well, I really enjoyed listening to all of you present and I think that the right points were made and just seems to me going forward, as General Fantini was talking about and Preston and John Bier and the other presenters, general Kumashiro and Stan, that it's not a technological challenge. It seems to me it's more of an organizational leadership challenge to bring together the right cards to avoid the stove pipe issues we've had before and get the true goodness that we've achieved. And there were some remarkable things department has done like BMC [inaudible 01:34:47] that people thought would collapse under its own weight at the outset. There's some of the critics I would say, and it didn't happen.

Mr. John Rood:

So there are some wonderful examples we can look to. And I just think that the discussion that our panels had about, the right approach, the human engineering that goes along with the technical engineering to allow for more agile approach. It's just one of the things that I wanted to underscore that I took away from listening to all of you today and points the way to the future because I think Riki's

right, the defense budget's going to be under a lot of strength and we're going to have to be better with the assets that we already have and the funds that we already have because the adversaries are not sitting still. They're not adhering to stay-at-home orders. They're not quarantining their work, all of that is continuing. So thank you to the panelists. I really enjoyed listening to all of you.

Mr. Riki Ellison:

Thank you, John. Thank you everyone. Really appreciate it. Thank you.

Maj. Gen. Michael A. Fantini:

Thanks for the opportunity, Riki.

Mr. Riki Ellison:

[inaudible 01:35:50].

PART 4 OF 4 ENDS [01:35:55]