

TOP 5 TAKEAWAYS

# DEFENSE ONE TECH SUMMIT

Defense One hosted its 5th annual Tech Summit from June 16th to June 18th, 2020, transitioning from the in-person conference format of years past to virtual roundtables and panels featuring defense technology leaders stationed from their home offices.

Over three days, defense leaders shared their vision for modernizing the warfighter and resolving threats to innovation, scale, and safety of the armed forces. In this research brief, Government Business Council presents the top takeaways from 2020's Defense One Tech Summit.

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## The next year marks a period of renewed acceleration in hypersonic weapon development

The Department of Defense (DoD) is pouring resources into developing hypersonic weapons, including hypersonic cruise missiles and boost-glide weapons, after years of divesting in the technology's innovation and testing. Hypersonic weapons offer the speed that existing cruise missiles cannot accomplish and the dynamic maneuverability that ballistics lack. They are hard to detect, and even more difficult to stop.

**“We kind of did the homework for the rest of the world. Hypersonics is an area that we essentially invented.”**

**Dr. Mark Lewis**

Director of Defense Research and Engineering for Modernization

Mike White, Principal Director for Hypersonics in the Office of the Under Secretary of Defense for Research and Engineering, predicts the rapid acceleration of offensive hypersonic systems in the next 12 months. Notably, a hypersonic glide body tested on March 19 off of Hawaii was the first in a series of tests the DoD has planned this year.<sup>1</sup>

Regarding the evolution of hypersonics, Dr. Mark Lewis, Director of Defense Research and Engineering for Modernization, said, *“We kind of did the homework for the rest of the world. Hypersonics is an area that we essentially invented.”*<sup>2</sup>

Panelists also spoke of the looming threat of Russia and China, who have not only adopted much of the technologies that America produced, but have expanded upon them. Both Russia and China claim that they have grown their programs in response to American missile defense system capabilities. However, Rebecca Heinrichs, Senior Fellow at the Hudson Institute, pushed

back on this idea, saying that American missile defense systems are not made to counter the arsenals that Russia and China have developed. She went on to express the sense of urgency felt by forces in the U.S. to develop weapons that can compete, counter, and respond to these adversaries.

Defending against hypersonic weapons is not an easy task. Defense first requires detecting an incoming hypersonic weapon moving at five times the speed of sound. Once detected, the DoD must respond. Dr. Lewis said, *“It is difficult to stop a hypersonic weapon, but it's not impossible.”* Heinrichs explained, *“The defense piece is also very important,”* and noted that there exists a disparity in funding for offensive and defensive hypersonic weapons in 2020, with \$2.6B allocated for offensive weapon development and \$206M for building defense systems. Experts urged DoD leadership to demonstrate department-wide buy in on defense systems to protect against hypersonic weapons.

To gain ground in the global hypersonic race, the United States will take risks to not only innovate but to develop these weapons quickly. Dr. Mark Lewis expressed confidence that the U.S. can soon lead the pack again in hypersonic capabilities, but was quick to add a clarifying follow-up: *“One thing that the United States has never lost the lead on, that is the innovation in this area.”*



# 2

## Cyber enables – but also requires – unprecedented levels of orchestration

Much of warfare is moving from land, sea, air, and space into cyberspace. As Thomas C. Wingfield, Deputy Assistant Secretary of Defense for Cyber Policy, explained during the Tech Summit, *“Because cyber touches every single part of our society...it’s a complex problem to weave all of those pieces together successfully.”*<sup>3</sup>

Conflict in cyberspace provides a massive enemy attack space to strike and a large attack surface to defend. Militaries are reliant on cyber for communication, information, navigation, and countless other functions that could potentially be disrupted. Developing superior technology and training expert teams is critical, but ensuring that all relevant players work together will be the key to long-term success.

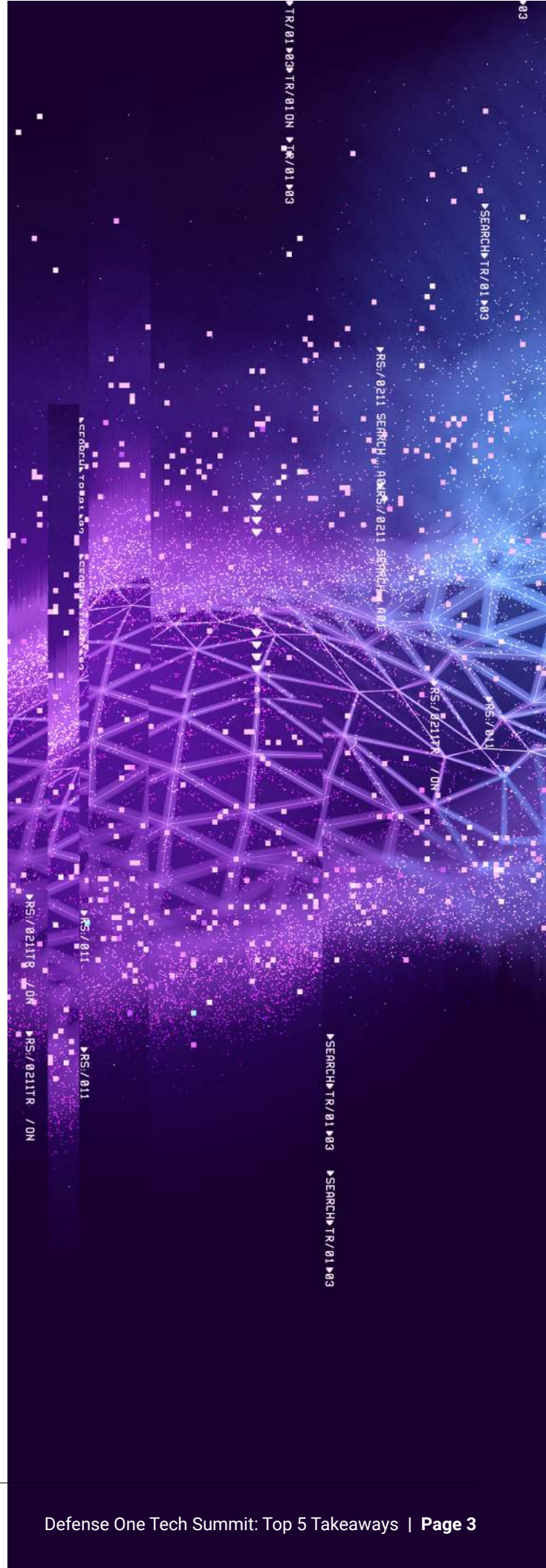
Perhaps the greatest challenge in this mass orchestration is the ability to share relevant, actionable data across defense operations. Organizations that are unable to dynamically share data-driven insights with each other are more vulnerable and may lack visibility over their attack surface, reducing the DoD’s defensive and offensive capabilities.

Cyber should link policy, operations, and strategy across the entire government—from the president to individual warfighters. Col. Brian Vile, Commander of the 780th Military Intelligence Brigade, remarked that his team embraced a *“whole of government approach”* to solve questions like *“How do we identify rapid series activities and intent? How do we deter them?”*<sup>3</sup>

The collaborative capabilities of cyber are powerful, but according to Col. Vile, *“If cyber is employed properly—and this is really the most powerful use of cyber—we never have to go into armed conflict.”* Cyber can take the place of traditional battlefields, keeping many more DoD personnel safe as they execute missions.

**“ Because cyber touches every single part of our society...it’s a complex problem to weave all of those pieces together successfully.”**

**Thomas C. Wingfield**  
Deputy Assistant Secretary of Defense for Cyber Policy



# 3

## The ability to dynamically share data will be the critical weapon in a country's arsenal

Cynthia Bedell, Director of the Computational and Information Sciences Directorate, spoke about current issues in data, saying that data needs to be accessible, actionable, and easily understood by the end user. Discussing this human-centered approach to big data, Bedell says: *"The algorithm is tailored to the user, so the user gets the information the way they need it and can process it quickly... Really what we need is data that can be turned into information by these algorithms."*<sup>4</sup>

According to her, the big question is, *"How do we get the right kind of information at the right time for the right algorithms?"*

Tim Grayson, Director of the Strategic Technology Office at DARPA, discussed technologies his agency is currently prototyping to improve data shareability, which extend to *"highly dynamic networks and communications, where all of that networking can be adaptively matched."* Using algorithms, artificial intelligence, and machine learning, DARPA develops technologies that aim to get actionable data to users despite on-the-ground constraints.

These ideal technologies meet reality in the *"hyper-enabled operator"* concept, a program spearheaded by Special Operations Command (SOCOM) and designed to enhance operators' cognitive capabilities in austere environments. For example, a warfighter stationed in a remote region would be granted data analytics and edge processing power that enables them to make decisions without needing to be sent data from an analyst hundreds of miles away, thus shortening the decision loop.<sup>5</sup>

Innovations aimed at enhancing information sharing capabilities must bridge the gap between warfighter data needs and the constraints of limited bandwidth and the existing tactical network. Lisa Sanders, Director of Science and Technology at SOCOM, believes the hyper-enabled operator and other innovations can finally address a long-standing problem in the DoD, which is limited processing bandwidth: *"Our guys often go out with what they can carry their back...so we're asking the question, what is capable with something I can put on somebody's back?"*

Although individual warfighters must be equipped with data for decisions, the DoD is also working to enable these insights in real time from a bird's eye view. Tim Grayson gave an example of a scenario his team hopes to solve: *"How do I decide that this airplane over here that belongs to the Air Force should team up with this airplane over here that belongs to the Navy to go support some Army action happening on the ground?"* Mosaic warfare, much like the art it's named for, creates large pictures out of many small pieces. This ability to make smart, collaborative, macro-level decisions is an extremely lethal capability.

**"Our guys often go out with what they can carry their back...so we're asking the question, what is capable with something I can put on somebody's back?"**

**Lisa Sanders**

Director of Science and Technology at SOCOM





## Industry Perspective

### Bill Bender

*Retired Lt. General and Strategic Account Executive at Leidos*

At Leidos, we believe you can't design a solution if you don't understand the mission. We're reimagining the industry-government relationship to provide [or to equip or to empower] the military with the capacity and technological capabilities of the private sector. Our knowledge and decades of industry experience enable Leidos to apply an unrivaled understanding of government challenges. We deliver secure, seamless solutions that exquisitely balance cost-effectiveness and efficiency allowing the Department of Defense (DOD) to focus on achieving its missions.



#### HYPERSONICS

During the Tech Summit, Dr. Timothy A. Barton, our Dynetics Group Chief Technology Officer, explained our role in the development of hypersonics, "We're looking to bring the capability to the warfighter to reduce their cost and risk and increase their performance." He discussed our groundbreaking work within offensive and defensive hypersonics, Counter-Unmanned Aircraft Systems (CUAS), and autonomous platforms.



#### SOFTWARE

We harness open-architecture, non-proprietary, and government-owned software to help move the DOD towards a digitally transformed future focused on network centrality over platform centrality.



#### COLLABORATION

Nearly overnight, the government transitioned to a highly mobile remote workforce, able to accomplish its mission at scale—a huge success. However, collaboration is different from the ability to remain connected. Leidos works to help the government better understand new workflows, utilizing process change and technology to create a more collaborative environment.



#### DATA-DRIVEN INSIGHTS

For a data management strategy, first, you need to know what you have, tag it, ensure it's secure, and finally, draw insights from it for better decision-making. Data-sharing is a critical task in front of the services. The first step is assessing what data you actually have and whether or not it's efficiently managed.

# 4

## Establishing norms and posturing is the first line of defense

Before engaging in an attack or provocative defense measure, international diplomacy sets the stage for what actions are deemed admissible, especially in the fifth domain—cyberspace. Lauren Zabierek, Executive Director of the Belfer Center for Science and International Affairs at the Harvard Kennedy School, called the current stage of cyber the “wild west,” as rules for the road are still being developed.<sup>3</sup> The Department of Justice (DOJ), often coordinating with United States international partners, works to develop cyber norms using indictments. Sometimes these indictments successfully punish the offender in question, but more often they serve to establish a set of norms.

The creation of norms educates harmful actors, lawmakers, and defense organizations worldwide about what actions are admissible. John Demers, Assistant Attorney General for National Security at the DOJ spoke about his department’s use of indictments to codify rules for the cyber battleground. For instance, the DOJ would not indict political or military espionage, but they would

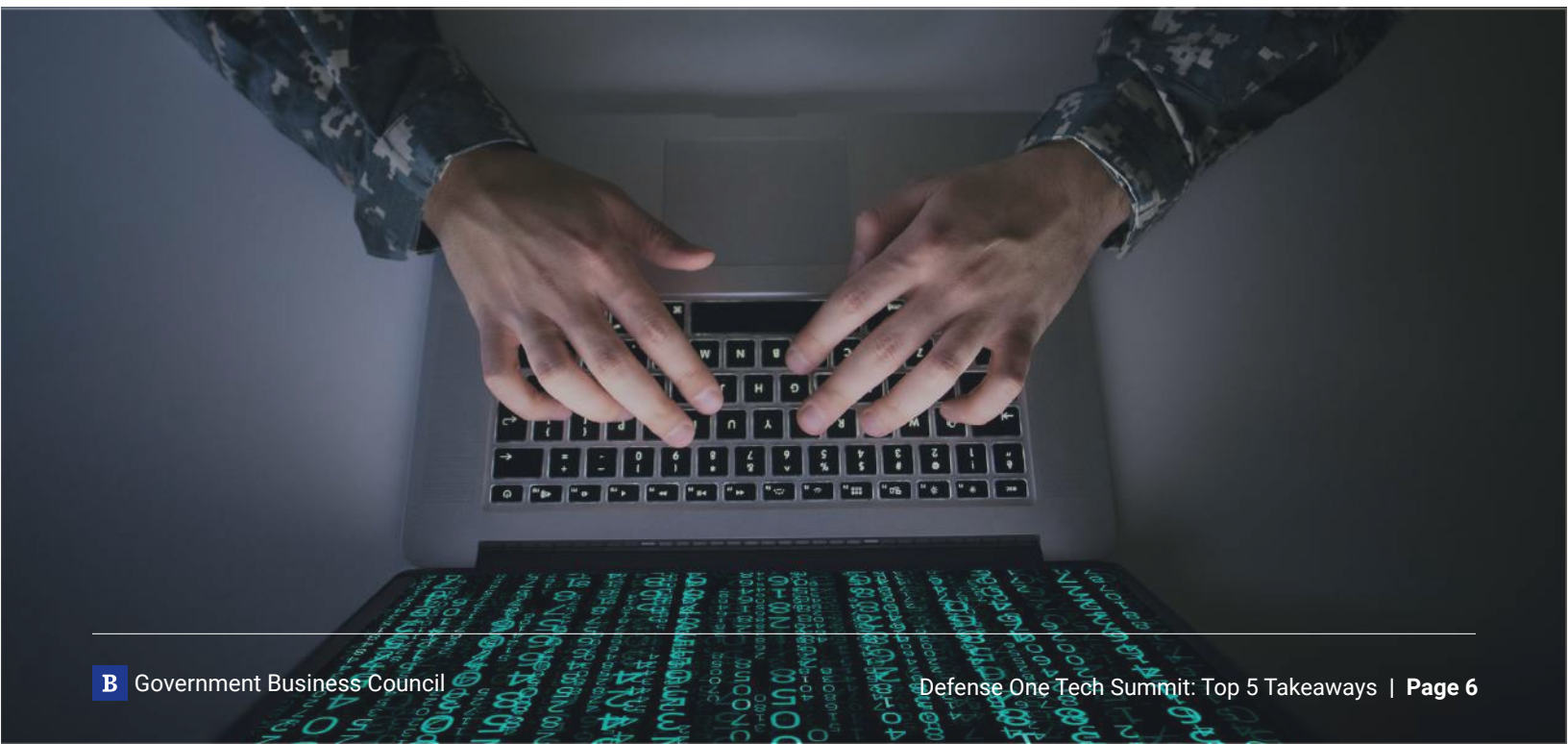
indict bank robbery, intellectual property theft, or election interference.

Experts spoke about the importance of walking the line between engaging in competition and conflict. An effective tool in this balancing act is showcasing DoD capabilities to adversaries as a way to deter potential attacks. Regarding the testing of hypersonic weapons, Rebecca Heinrichs, Senior Fellow at the Hudson Institute, spoke about the U.S. need to conduct these tests to bolster its credibility. As Heinrichs says, “We’re trying to complicate the adversary’s calculus that they are able to get off an act of aggression at a political cost that would be worth it for them.”<sup>2</sup>

Similarly, Col. Brian Vile, Commander of the 780th Military Intelligence Brigade, explained that DoD intentionally showcases trained forces on websites and public platforms to deter adversaries. He says, “The amount of training and the amount of time that it takes to build some of our soldiers is measured in years, not months. These are top tier operators. Having them, knowing that they’re there, that’s a deterrence in itself... We know what we do, and we present it to our adversaries.”

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**Col. Brian Vile**  
Commander of the 780th Military Intelligence Brigade



# 5

## Addressing the workforce problem

Before engaging in an attack or provocative defense measure, international diplomacy sets the stage for what actions Office of Personnel Management (OPM) data shows that for every five members of the government tech workforce over the age of 60, there is only one under the age of 30.<sup>6</sup> The government has long been decried for being an unattractive place to work for top talent, but the DoD is working to fight that perception.

Christan Johnson, Talent Lead for the Defense Digital Service (DDS) discussed the need to *“use technology to meet the technologists.”*<sup>7</sup> She suggests, for example, going to technology conferences and using recruiting sites that technologists use instead of USAjobs.com. Johnson says these methods have been successful, and 90% of her team comes from the tech industry, which enables DDS to use referrals to further grow the team.

Retaining young professionals is also a key variable for a strong workforce. Agencies often struggle to retain young professionals, who seek faster-paced environments or better salaries. Johnson pushes back on this, saying that technologists want to stay on in her office because they have been able to match mission to talent. She joked that you can't hack a satellite at Google, but you can at DDS. *“It's because of the work that they're doing, it's because of the impact they're having, and it's because of the lives that they're saving,”* explained Johnson.

Other strategies that technology teams have mentioned start at the university level. By linking with top scientists, teams at the DoD are able to tap into networks of engineers, scientists, and students passionate about making a difference. Dr. Lewis, Director of Defense Research and Engineering for Modernization, notes that COVID-19 has slowed down some university efforts as most students are home and teams are taking precautions; however most projects have kept momentum as critical research operations continue at universities.<sup>2</sup>

Innovative recruitment, impactful work, and comprehensive remote onboarding has kept the DoD workforce growing at a steady pace in spite of COVID-19's impact. Interestingly, this pandemic may prove helpful to Defense agencies seeking the brightest talent, as young tech professionals seek stability and unique opportunities to help shape the future of the U.S.

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Christian Johnson  
Talent Lead for the Defense Digital Service



## Endnotes

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### Government Business Council

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