Opening Keynote, Hosted Payload Summit
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"In less than a generation, space has fundamentally and irrevocably changed." So wrote our outgoing Deputy Secretary Bill Lynn in a recent issue of the Washington Quarterly.

Space is increasingly a shared domain in which we operate with more and more space-faring countries – both close allies and potential adversaries. We are challenged in that space is increasingly <u>congested</u> with increasing amounts of space debris; <u>contested</u> by a growing range of foreign counterspace capabilities; and <u>competitive</u> as more and more countries and companies operate in space.

In response to these challenges, the Secretary of Defense and the Director of National Intelligence approved a new National Security Space Strategy, delivered to Congress in February. This strategy is significant in several regards:

- It is the first-ever National Security Space Strategy;
- It applies to the full range of national security activities in space; and
- It signals that – just as the space environment has changed –the way we advance our national security through space must also change.

One new approach is the concept of hosted payloads, the focus of today's Summit. Hosted payloads have the potential to help us with two challenges we face in implementing the strategy: first, the growing importance of resilience, and second, growing constraints on our funding.

The Importance of Resilience

One of the "three C's" driving the new strategy is the increasingly contested nature of space. Potential adversaries are seeking to exploit perceived space vulnerabilities. They are doing so through a range of counterspace capabilities that threaten space assets and supporting infrastructure. These capabilities range from widely available jamming technology to highly-sophisticated, kinetic anti-satellite weapons and cyber attack. One facet of the National Security Space Strategy's effort to "prevent and deter aggression" against our space infrastructure is to "strengthen the resilience of our architectures to deny the benefits of an attack." The strategy notes that resilience will also "enable our ability to operate in a degraded space environment."

As we invest in next generation space capabilities and fill gaps in current capabilities, the strategy directs us to include resilience as a key criterion in evaluating alternative architectures.

Resilience is not the property of a single system. Rather, it is the ability of a whole architecture to provide functional capabilities necessary for mission success despite environmental adversity or hostile action.

Resilience can be achieved in a variety of ways in space and beyond. These include system protection, cross-domain solutions, leveraging foreign capabilities, maturing responsive space capabilities, and—yes—hosting payloads on a mix of platforms.

The launch of ORS-1 this summer demonstrates one means to achieve resilience. But resilience cannot be an experiment. It cannot be the exception. In an increasingly contested environment, resilience must be institutionalized into our architectures.

With this in mind, the Secretary directed us to develop a definition for resilience and criteria for assessment. We can no longer think only in terms of cost and capability. We must also consider whether that capability will be available when the warfighter needs it and an adversary seeks to deny it. Today, for the first time, I'd like to share with you how the DoD intends to define and measure resilience. Our definition is simple:

"Resilience is the ability of an architecture to support the functions necessary for mission success in spite of hostile action or adverse conditions. An architecture is "more resilient" if it can provide these functions with higher probability, shorter periods of reduced capability, and across a wider range of scenarios, conditions, and threats. Resilience may leverage cross-domain or alternative government, commercial, or international capabilities."

This definition was reviewed and improved by the Defense Space Council and is now being promulgated. DoD is implementing the definition and associated methodology for evaluation through current and future architectures. We are implementing it across the Department's requirements, acquisition, and budget processes.

Operating in a Funding-Constrained Environment

The new strategy builds on the "three Cs" -- congested, contested, and competitive -- but must be implemented in the context of a fourth -- constrained. I have heard some argue that we cannot afford the National Security Space Strategy under budget constraints. I disagree. In fact, we CANNOT afford NOT to implement the strategy.

Past approaches have trapped us in a vicious cycle of delayed capability, mounting cost, and increased vulnerability. The new strategy opens potential paths to containing cost while still building capability and resilience. It calls for leveraging commercial capabilities. It advocates taking advantage of foreign capabilities to augment our own. And it encourages options such as hosting payloads on commercial satellites or even foreign satellites.

The Air Force's Wideband Global Satellite (WGS) system provides a good example.   Our close ally Australia has bought into the system, and the Air Force is in the final phases of developing similar arrangements with several other allies. This approach has increased the size and capacity of the constellation. Internationalizing WGS also complicates the calculations of any country contemplating an attack on the system.

In many mission areas, the approaches in the new strategy, as well as the current budget environment, point to mixed constellations of government, commercial, and foreign systems using a greater number of simpler, less-expensive spacecraft or hosted payloads to assure essential capabilities. In some cases, it may even point to purchasing services rather than hardware. And these services could be provided by hosted payloads. In some cases, "state of the world" capabilities may be sufficient to meet warfighter needs, rather than capabilities that are "state of the art" but expensive and vulnerable. And these capabilities could be provided by hosted payloads.

A Role for Hosted Payloads

Hosted payloads are one of the ways to assure space capabilities in the congested, contested, and competitive space environment. Disaggregating payloads onto different satellite buses helps distribute the benefit as well as the risk. Further, innovative opportunities like hosted payloads are one way the U.S. government might address impending budget constraints.

A pathfinder for DoD on hosted payloads is CHIRP, the Commercially Hosted Infrared Payload that launched aboard a commercial communications satellite less than two weeks ago. CHIRP is a pathfinder in another way: It will provide a first look at wide-field-of-view technology. This technology will benefit our missile warning and defense, technical intelligence, and battlespace awareness missions. Imagine hosting such a sensor across a range of defense, commercial, and allied satellites, to provide broad, resilient coverage at reasonable cost.

We are continuing to study the potential for hosting mission payloads on commercial satellites, weighing the size, weight, and power of the payload, the orbits of the satellites, national security sensitivities, and the possibility for mutual benefit. We look to industry to help us build the business case and identify ways to use hosted payloads to enhance the national security benefits we derive from space.

Conclusion

The space environment has changed, and we must change with it. The challenges presented by the three Cs and the budget environment require that we seek alternatives to our traditional approaches, alternatives that balance between performance, affordability, and resilience. This will require innovation on your part. This will require new thinking and practices on ours.

I welcome this Summit as a way to explore one innovative approach. Thank you, and I look forward to your questions.