

WHY AN INDUSTRY PARTNERSHIP IS CRITICAL TO THE GOVERNMENT'S FUTURE IN SATELLITE COMMUNICATIONS

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ABSTRACT

When Department of Defense (DoD) leaders have a satellite communications requirement, they frequently seek commercial solutions. To varying degrees, these needs are met effectively today. Yet, with an integrated satellite communication (SATCOM) architecture – both government and commercial – the future solutions will be delivered more efficiently. The government should partner with commercial satellite providers that build systems from the ground up with U.S. government users in mind, thereby, augmenting military satellite resources cost-effectively, wherever and whenever needed.

The private sector understands what DoD architectures require, what the budget restrictions are, and how to plug in the remaining holes. And industry can do so much faster than the public sector: average time from concept to launch for commercial SATCOM (COMSATCOM) takes three to four years, as opposed to ten to 15 years for military satellite communications (MILSATCOM) projects¹.

Senior government leadership has recognized the need for better integration and reliance on COMSATCOM, and adoption of an enterprise-level integrated SATCOM architecture and strategy. This unified, strategic partnership will enable DoD to manage MILSATCOM and COMSATCOM as a holistic capability to best support servicemen and women.

The partnership will create a synchronized, integrated architecture that enables increased, end-to-end capability and interoperability among ground, terminal and space segments. This includes terminals designed to work in multiple bands across both military and commercial satellite systems. Such capability allows government users to supplement their capacity through commercial providers, while still using existing Wideband Global SATCOM (WGS)-certified terminals. It also helps government agencies save greatly on taxpayers' dollars, while better supporting end-users by filling capacity gaps where WGS coverage is limited or nonexistent.

Combining these modern technologies and capabilities within MILSATCOM systems, users can turn to MILSATCOM for core requirements, then, seamlessly integrate commercial technologies to fill in all gaps to achieve absolute protection, resiliency and global portability.

INTRODUCTION

Years from now, government and industry leaders may recall this era as the 'Age of SATCOM Integration': a period when we recognized the inefficiencies and, ultimately, incoherence of the historic acquisition models and worked together as partners to provide relevant SATCOM capabilities for an improved integrated operational architecture.

The high standard of performance will be made possible, to a large degree, by commercial satellite communication providers who invest in SATCOM solutions with U.S. government users in mind, thereby, augmenting military satellite resources cost-effectively, wherever and whenever needed. The private sector appreciates the complexities of DoD architectures, recognizes the budget restrictions and will play an essential role in this integrated SATCOM architecture of the future. With a strong business case supported by clear demand signals, industry is able to innovate more rapidly than the public sector: Average time from concept to launch for COMSATCOM takes three to four years, as opposed to ten to 15 years for MILSATCOM projects¹.

The shift involves a profound change of mindsets. No longer should agencies think in terms of “buying” exclusively government-owned satellite communications. Instead, they can primarily leverage the immense breadth and scope of COMSATCOM offerings for enriched capabilities, right alongside a finite set of unique, purpose-built government assets deployed only as and where required.

This approach allows the government to gain much needed clarity and cohesion. For over a generation, the government has resigned itself to a model in which multiple DoD branches are responsible for varying elements of the capability, turning to private industry generally on an “as needed” basis: The Navy supplies the narrowband space segment. The Army provides the “land” part, i.e. both military-owned and commercial terminals for units. The Air Force meanwhile acquires the space segment for wideband and protected SATCOM, while the Defense Information Systems Agency (DISA) oversees commercial, satellite-enabled bandwidth availability. Exacerbating these complex arrangements, the gateway infrastructure that supports each of these threads is stove-piped as well.

Fortunately, senior government leadership is recognizing the need for better integration and reliance on COMSATCOM for the adoption of an enterprise-level integrated SATCOM architecture and strategy. This unified, strategic approach will enable DoD to manage MILSATCOM and COMSATCOM as a holistic capability to best support national security objectives.

The FY 2016 National Defense Authorization Act (NDAA) is paving the way for an ambitious overhaul of wideband SATCOM acquisition. The NDAA calls for the Secretary of Defense to conduct an analysis of alternatives for a follow-on wideband satellite communications system and to designate a single, senior DoD official to procure wideband SATCOM. It also approves a pilot program through which the Secretary of Defense would deploy a variety of methods to “effectively and efficiently acquire commercial satellite communications services².” The submitted plan required by March 2017 must include a detailed cost assessment of SATCOM services, to include projected costs savings of such a consolidation.

This follows the July 2015 Government Accountability Office (GAO) “Defense Satellite Communications”³ report, which recommended that the DoD conducts a spending analysis to identify SATCOM procurement inefficiencies and opportunities, while evaluating whether greater centralization of COMSATCOM would benefit the DoD. Currently, procurement of MILSATCOM and COMSATCOM are hindered due to a lack of awareness of what is spent on COMSATCOM and a resistance to the centralization of SATCOM acquisitions, according to the GAO.

Ultimately, DoD and commercial satellite leaders should seek to work together in the spirit of a full partnership, to remove inefficient, siloed acquisition procedures and practices in favor of a more streamlined, consolidated model. With this, a synchronized, integrated satellite communication architecture would take hold in which commercial SATCOM is an integral solution for warfighter SATCOM requirements. The architecture would enable increased, end-to-end capability and interoperability among ground, terminal and space segments, including user terminals designed to work in multiple bands across both military and commercial satellite systems.

The seamless interoperability as a result of this integrated architecture will allow government users to maximize the return on investment (ROI) of their existing MILSATCOM systems, to include international allies and partners, enabling them to acquire superior coverage, capabilities, reliability, resiliency and security, at an extremely competitive cost point.

BACKGROUND ON HISTORY

Up to the beginning of the 21st Century, 'status quo' worked: There were plenty of military-based satellite resources to cover operations. After 9/11, however, the very face of warfare changed. The conflicts in Iraq and Afghanistan created the current state of highly mobile, asymmetrical engagement. Ground, air and sea units must be ready to go anywhere, at any time – and depend upon mobile, data-intensive applications, such as streaming video for Intelligence, Surveillance and Reconnaissance (ISR). They don't care about which branch of the military 'owns' which part of the communication architecture, or whether the actual technology is supplied by a DoD or commercial provider. They want results, in the form of maximum capability, flexibility and resiliency.

The U.S. National Space Policy of June 2010⁴ states that "a robust and competitive commercial space sector is vital to continued progress in space" to "increase assurance and resilience of mission-essential functions ... against disruption, degradation and destruction, whether from environmental, mechanical, electronic or hostile causes."

According to the DoD's Satellite Communications Strategy Report⁵ of August 2014, the military is consuming ten times more bandwidth than in 2001, and that a five-year plan should include a greater commercial presence. It also notes that the decentralized approach hinders the DoD's ability to manage both military and commercial SATCOM "as a holistic capability to best support the warfighter," according to the report. It continues to note that the DoD "may have to move toward a 'shared resource' model of usage, versus the current 'my demand/my capacity' separatist philosophy. This will require a centralized management strategy with resource monitoring and management performed on an 'enterprise-level' instead of the current method that allows users to implement (and pay for) resource monitoring and usage management at their own discretion."

Consequently, other developments further speak to a rising consensus for a more consolidated, integrated approach to wideband SATCOM acquisition on the part of the military's senior leadership, indicating that integration with COMSATCOM is essential to the success of military SATCOM capabilities in the future. Here are some key highlights:

In April 2015, at the 31st Annual Space Symposium, Secretary of the Air Force Deborah Lee James⁶ indicated that space systems were designed and built for an uncontested environment, but this is no longer the case. Government leaders must commit to absolute

situational awareness though increased modeling, simulation, training and operational exercises. “It is not just about acquiring new capabilities,” she added. “It is also about getting more bang for our buck by coming up with new ways to use existing capabilities ... to deliver what we hope to be game-changing capabilities to combatant commanders with eyes on the battle space.” Rather than attempting to do this alone, the government should pursue proactive partnerships with private industry. “We need to continue to partner with industry and make positive adjustments,” she said.

In June 2015, the Joint Space Operations Center (JSpOC) launched the Commercial Integration Cell (CIC) pilot program⁷ to explore a partnership between DoD and the satellite industry. “The CIC will allow for rapid identification, diagnosis and resolution of on-orbit anomalies while also increasing the overall resilience of U.S. government satellite operations,” according to U.S. Navy Cmdr. David Samara, former deputy director of strategy and plans at JFCC Space. Lt. Gen. Jay Raymond, former Commander of JFCC Space and the 14th Air Force (Air Forces Strategic) described the CIC pilot as “the next step in our ongoing efforts to partner with like-minded space-faring entities to promote the peaceful and responsible use of space” through the enhanced integration of industry capabilities into day-to-day space operations.

In July 2015, General John Hyten, Commander of U.S. Air Force Space Command, issued an “Intent on (Ongoing Material) Decisions”⁸ memorandum in which he wrote that even the newest space systems “lack required resiliency and survivability. We must retool our entire space architecture to one that can be commanded through a robust common ground platform.” The WGS satellite bus operations should move to commercial operators performing satellite control – possibly from commercial facilities and with the commercial satellite control network – “as soon as possible within contract constraints.”

In addition, he called for the evaluation of all legacy constellation satellite operations for possible transfer to commercial operators and the commercial network, or to a common enterprise ground solution. “We must weigh both the impact of repurposing Airmen for mission operations and return on investment,” according to the memo.

In October 2015, the DoD expanded the leadership role of Secretary James⁹, naming her as principal DoD space adviser (PDSA). Secretary James will seek to bring cohesion to space acquisitions, chairing the Defense Space Council (DSC) while delivering recommendations to the DSC on space issues. She will also provide independent assessments and proposals to Deputy Secretary of Defense Robert Work’s management action group when the DSC cannot reach a consensus on decisions. Secretary James is expected to emerge as the top advisor for space, with the potential to usher in a new era of strategic focus. “My priority is to ensure a properly funded strategy that allows for innovation across the DoD space portfolio, enabling us to meet the challenges of a rapidly changing environment,” she said, as her appointment was announced.

LPTA PAIN POINTS

Alongside those positive developments related to policy, there are lingering difficulties created by the piecemeal structure of procurement. In further complicating the issue, agencies are under increasing pressure to conform to Lowest Price Technically Acceptable (LPTA) policies for purchases. Under LPTA, decision-makers select vendors who offer a minimally technically acceptable proposal at the lowest evaluated price.

LPTA has its place, even in the military community, especially when buying commoditized products readily available “off the shelf” but not for critical communication capabilities and services. Wideband SATCOM for military users does not fit a commoditized, “one size fits all” description. Every procurement presents an array of requirements and operational imperatives. These may include security requirements (such as encryption differentiators), geographic requirements and functionality requirements such as video distribution, Intelligence, ISR support as well as additional capability-focused considerations. When human lives and critical missions are on the line, it is difficult to justify an LPTA approach to SATCOM acquisition where the value proposition must be far greater than merely the cheapest price.

SAFETY IN SPACE ISSUES

The confusing, siloed state of SATCOM acquisition and heavy dependence upon LPTA create formidable obstacles to ideal SATCOM integration, with the potential for substantial consequences in light of growing, significant threats to the space domain. The satellite environment in which we collectively operate is far from benign. “Unfortunately, there are some nations that have chosen to demonstrate anti-satellite weapons that not only destroy the satellite, but create debris that threatens the entire space environment,” said Secretary James¹⁰.

It is an issue that demands immediate attention, especially as our space environment grows increasingly congested and contested: The DoD monitors an estimated 22,000 man-made objects in space, and 1,100 of them are active satellites¹¹. (Debris or inactive satellites account for most of the rest.) About 60 nations own and operate satellites, and the Federal Aviation Administration (FAA) Commercial Space Transportation (AST) and the Commercial Space Transportation Advisory Committee (COMSTAC) project that nearly 30 commercial space launches will take place annually through 2021¹².

The abundance of traffic in and throughout space increases the risk for accidents and operational disruptions. To respond, leadership within the industry and government is jointly developing strategies and policies to ensure satellite launches and operations are conducted within a safe, orbital environment. During a House Committee on Armed Services hearing in February of this year, Admiral Cecil D. Haney, Commander of the United States Strategic Command¹³, said “... we must continue to reinforce the peaceful use of space while ensuring continued space operations through partnerships and resiliency ... The U.S. continues to partner with responsible nations, international organizations and commercial firms to promote responsible, peaceful and safe use of space. We also strive to maximize the advantages provided by improved space capabilities while reducing vulnerabilities; and seek to prevent, deter, defeat and operate through attacks on our space capabilities.”

Lt. Gen. David Buck, Commander, 14th Air Force (Air Forces Strategic), Air Force Space Command; and Commander, Joint Functional Component Command for Space, U.S. Strategic Command, echoed Admiral Haney’s sentiments during his testimony¹⁴ to Congress on March 15, 2016, saying that “there isn’t a single aspect of our space architecture, to include the ground architecture, that isn’t at risk.” According to Doug Loverro, the Deputy Assistant Secretary of Defense for Space Policy, as part of the same testimony, deterrence against foreign nations’ space attacks is based on defending against missile strikes or other attacks and making

sure satellite operations will not be disrupted in war. That would be carried out through partnering with the growing commercial space sector that is expected to deploy hundreds of new satellites in the coming years that could be used as back-up systems for the Pentagon in a conflict. Increasing threats justify several national imperatives including the augmentation of U.S. space situational awareness; the integration of U.S. military and intelligence space operations; and the strengthening of space-related ties with U.S. allies and commercial space operators.

A House Armed Services Committee Report prepared as part of the aforementioned National Defense Authorization Act recognized the importance of secured, more integrated satellite communications¹⁵. The committee backed efforts to leverage existing military and commercial satellites to ensure the safeguarding of military units. Such efforts included the utilization of protected tactical waveforms for commercial satellites and WGS, as well as a cost-benefit analysis of options to counter electromagnetic interference. “The committee believes in the importance of a robust ability for the warfighter to monitor, detect, characterize, geolocate and report sources of radio frequency interference on U.S. military and commercial satellites that are in direct support of combatant commanders,” according to the report. “The committee is concerned that the Department has not developed a clear strategy to meet the related warfighter requirements.”

Such a strategy remains critical to preserve the freedom that allows for the appropriate level of spectrum access – access that serves as the lifeblood of SATCOM, supporting national security objectives during global missions.

BROAD ADVANTAGES OF PARTNERSHIP/INTEGRATION

Through a productive partnership, military users will benefit dramatically through an emerging concept that we call SATCOM as a Service. This robust and global approach integrates complex solutions within an end-to-end managed service architecture, creating greater suitability, security, functionality, flexibility and resiliency. With this, warfighter access SATCOM on-demand with seamless availability of communication capability, equipment terminals, backhaul, capacity and desired features.

SATCOM as a Service is ideal for the global, mobile age; users travel from one location to another and simply “plug in” for instant connectivity. All they need is an IP address. In this sense, SATCOM as a Service is about ubiquity, an “anytime/anyplace” state of access through which users leverage both COMSATCOM and MILSATCOM as integrated resources in a complementary model. U.S. and allied troops depend upon mobile, mission-critical and often data-intensive applications, such as streaming video for ISR for their operational effectiveness. It is immaterial to them whether it is supplied by trusted commercial providers or the DoD. Warfighters only want/require mission success and reliable communications is the enabler. An integrated SATCOM architecture developed in partnership with the SATCOM industry is instrumental to meeting the national security requirements of today and tomorrow

Toward this goal, SATCOM as a Service empowers military units with more robust and globally available capability without the complexity of stitching together disparate networks. Among the many value distinguishers are:

Global coverage. Troops must stand ready to go to all regions of the world, on a moment's notice. Because the location and timing are often unpredictable, portable commercially-supplied SATCOM capability assures worldwide availability with seamless reliability. Advancements in Ka-band are further making this a reality, fielding global coverage via a comparatively greater number of diverse orbital locations. Recognizing that commercial and military Ka-band frequencies are adjacent, advancing the development of hybrid terminals to cover an extended Ka-band range further enhances the operational flexibility and redundancy for the military. Thus, when MILSATCOM Ka-band service is not available, users can use flexible terminals to access commercially available Ka-band SATCOM across the continuum of mil-commercial spectrum.

This saves on costs by streamlining the use of equipment, while allowing military users to readily switch between government systems and private-sector infrastructure on the same hardware, opting for what is best suited for their mission. The SATCOM as a Service capability is available wherever military units go, unlike experiences with historical VSAT systems. That piecemeal process costs time and money. Through interoperable Ka-band worldwide networks, commanders no longer "hope" for coverage or preposition inefficient transponder leases thus reducing expense and risk.

Protection. Industry invests in protection required to create a wideband environment with increased resistance to jamming and other forms of interference. As a result, government users are better positioned to work within various congested scenarios, even if the scenarios are intentionally caused by an outside party. In 2015, Inmarsat and its partners achieved a major milestone by successfully demonstrating the largest bandwidth-protected tactical waveform test to date, bolstering the government's ability to communicate using Inmarsat's commercial satellites while withstanding the most heavily contested environments.

CONCLUSION:

Partnerships – not rivalries – build integrated environments. This is more about changing mindsets than coming up with something technically dazzling: There are plenty of "Us vs. Them" sentiments when it comes to going with either government or commercial providers, instead of pursuing an integrated 'One SATCOM' framework. We must collaborate together so private industry complements existing government strengths by filling in gaps and enhancing the robustness of the architecture, therefore, improving protection, resiliency and global portability, alongside efficiencies and cost effectiveness.

In times of duress, warfighters do not care about the pathway that produces the satellite access, capacity and capabilities that they are counting on. They only care that the functions are going to be there when they need them, regardless of their location.

Trusted business leaders cultivate close relationships with government leadership and users and listen closely when they speak about their needs. Those collaborative efforts help industry to invest wisely in responding to government requirements to develop secure, reliable, resilient, flexible and capable SATCOM that is fully interoperable with MILSATCOM – anytime, anywhere. Ultimately, service men and women users will emerge as the winners – no matter where on the globe they go.

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