

# Ten Ways Cloud Computing Is Revolutionizing Aerospace and Defense



## At a Glance:

- The KPMG study shows just how important cost reduction and improved collaboration are to aerospace and defense manufacturers.
- 48 percent of aerospace and defense manufacturers are planning for the future by investing in current market expansion.
- The lack of alignment between operations and real-time customer demand is a great challenge for 49 percent of aerospace and defense manufacturers.
- Only 9 percent of aerospace and defense manufacturers have complete visibility across all three tiers of their supply chains.

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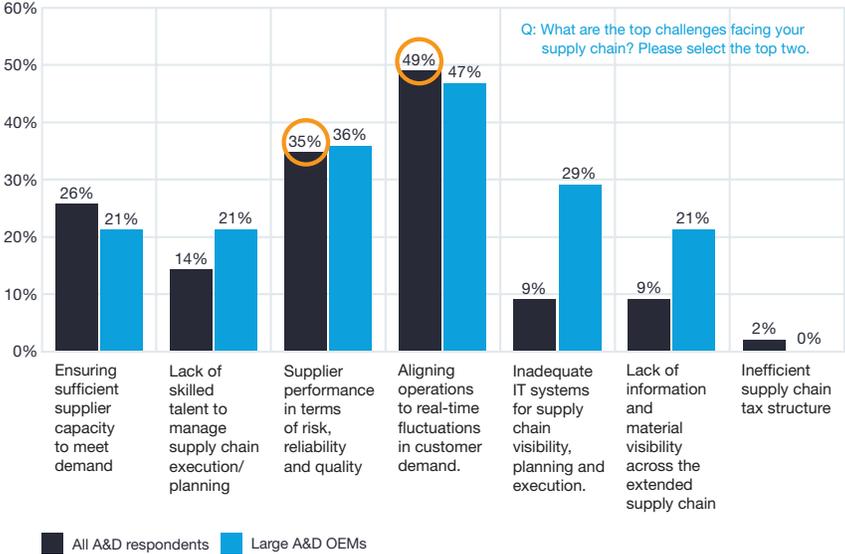
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Synchronizing new product development, supply chain, production and Maintenance, Repair & Overhaul (MRO) strategies across aerospace and defense (A&D) manufacturers while reducing costs continues to make cloud platforms a viable option. According to the 2013 Global Aerospace & Defense Outlook published by KPMG, 53 percent of A&D manufacturers said that reducing their cost structure would be their top strategic priority for the next two years.

Forward-thinking A&D manufacturers are quickly getting beyond the quick fix of cost reduction strategies and relying on collaboration to reduce costs and improve product and service quality. The KPMG study shows just how important cost reduction through improved collaboration in every phase of the A&D value chain is. Here are several key takeaways from the KPMG study that illustrate why cost reduction through collaboration and more effective use of information is so critical:

- Only 27 percent of A&D manufacturers have visibility past tier 1 suppliers, and just 9 percent have complete visibility across all three tiers of their supply chains.
- 49 percent of all A&D manufacturers say that aligning operations to real-time fluctuations in customer demand is their single greatest challenge, with 43 percent of large A&D Original Equipment Manufacturers (OEM) mentioning the same.
- 35 percent of all A&D manufacturers report that supplier performance in terms of risk, reliability and quality is a major impediment to being more responsive to customer demand.
- 71 percent of A&D manufacturers still rely on forecast demand as part of their manufacturing, purchasing and replenishment decisions, with the shift occurring to real-time inventory visibility becoming a requirement for current and future projects.

Significant challenges in aligning operations to real-time fluctuations in customer demand



Source: Economist Intelligence Survey, Nov. 2012

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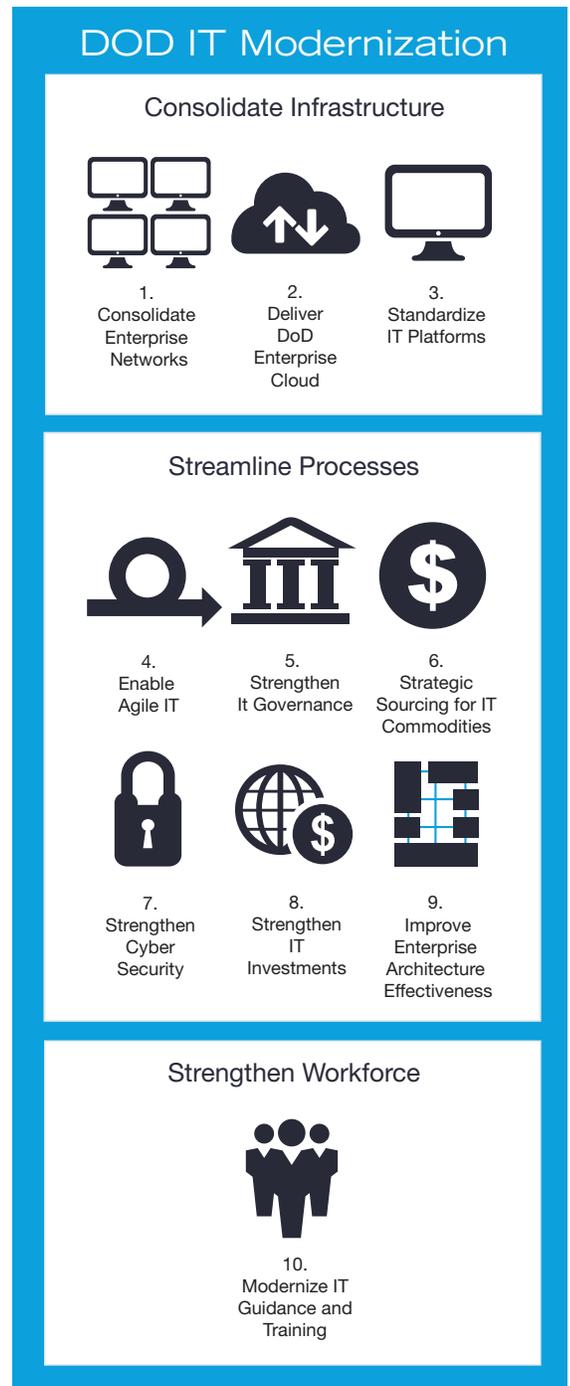
- 48 percent plan on investing in current market expansion to attain growth and profitability objectives, with 56 percent of large A&D OEMs planning to maintain and grow critical mass in their core markets through the use of more effective technology.

## The Importance of the DOD Cloud Computing Strategy

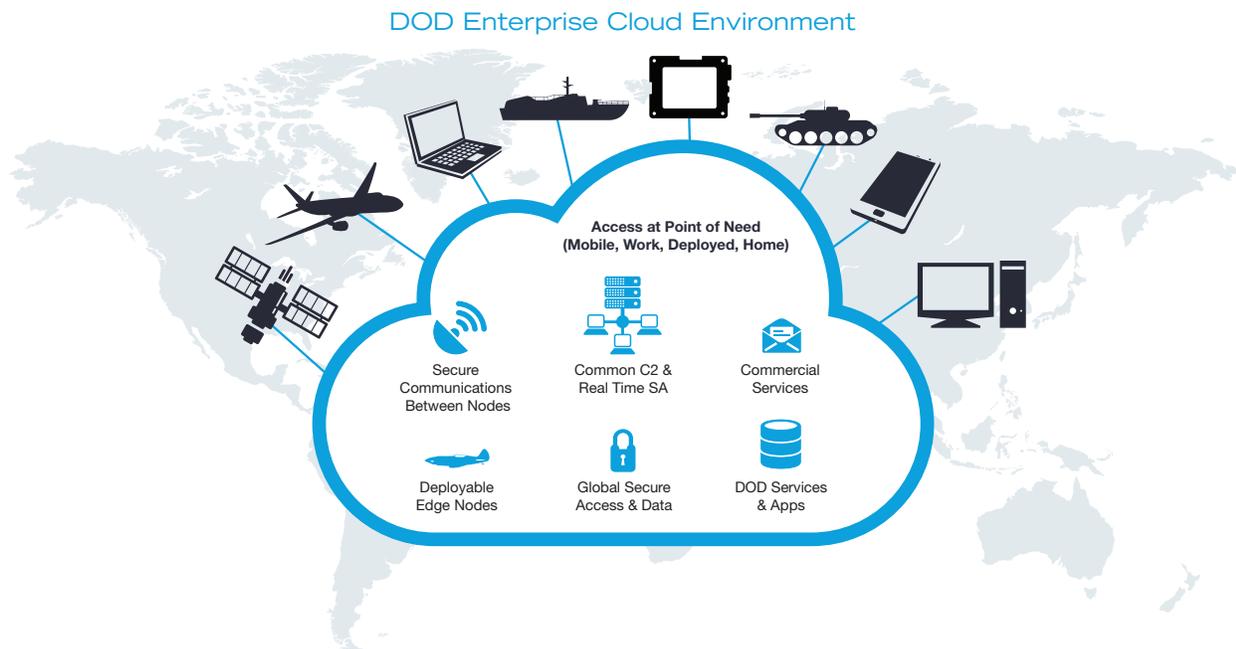
With sequestration having an impact on these industries from both a budget and merger and acquisition (M&A) perspective, the economics of cloud computing are becoming even more attractive. Teri Takai, CIO of the Department of Defense (DOD) published the DOD Cloud Computing Strategy in July of last year and many of its findings are reflected in the current state of cloud adoption in A&D. She recently published the DOD CIO’s 10-Point Plan for IT Modernization, which is available for download from the department’s website. The chart to the right is a summary of key DOD IT modernization initiatives.

It’s ironic that two industries which are highly reliant on collaboration often have the most siloed legacy systems, processes and IT infrastructures. As one aerospace executive explained recently, the industry sees cloud computing as a solution to what many jokingly call “silos of excellence” that slow down progress. Aerospace executives also speak of security concerns, especially in the area of globally-based defense support and logistics platforms.

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## Greater Collaboration, Lower Costs



Defense Information Systems Agency (DISA) Director Lt. Gen. Ronnie Hawkins Jr. was recently interviewed by Defense News, and his comments reflect what is often heard from aerospace and defense companies as well. He says a more enterprise-wide approach to managing information systems is needed to break down functional and service-unique barriers of the past to increase collaboration. He's also leading the DISA in partnership with the Defense Logistics Agency (DLA) to attain a 20 percent cost reduction in his agency, relying in part on cloud computing to reduce costs. Consolidating down to one email system, virtualizing applications in a hosted environment, and moving capabilities to the cloud are integral to achieving the 20 percent cost reduction. Ultimately he sees the DISA becoming a cloud service broker.

Lt. Gen. Ronnie Hawkins Jr. defines a vision for DISA that is reflected across the A&D industry, and explicitly defined by the CIO of the Department of Defense. In the latest DOD Cloud Computing Strategy, the enterprise cloud environment above has been defined. The role of mobility, secured communication between nodes, global secure access and data, and DOD services and applications are all included in this enterprise framework. Cloud platforms are integral to the attainment of this vision, which is already in the process of being fulfilled.

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## How A&D Requirements Are Turning Into a Catalyst for Greater Cloud Security

Lt. Gen. Ronnie Hawkins Jr.'s comments reflect the concerns defense agencies and their supply chains have regarding cloud security. He highlights the need for close coordination with the commercial, private sector cloud computing vendors to ensure the cloud security architecture requirements of the DISA are reflected in future product designs. One can infer the DISA requirements currently outpace those available from commercial, private sector vendors. This is encouraging, because it means A&D's requirements are a catalyst of continued improvement in cloud computing security. In addition, recently in Los Angeles, the American Institute of Aeronautics and Astronautics (AIAA) held Aviation 2013, where their AIAA Framework for Aviation Cybersecurity was presented. The framework shows why security is so critical to commercial and defense-related aviation in financial terms. For the A&D industry to get the full value of cloud computing, commercial cloud computing vendors have got to invest heavily in security research and development (R&D) over time.

## How Cloud Computing Is Revolutionizing Aerospace and Defense

In speaking with aerospace executives and following defense-related adoption of cloud technologies, these are the top ten ways cloud computing is revolutionizing the A&D landscape:

**1. De-Siloing Quality and Compliance Management across production is leading to greater supplier audit consistency and reduced compliance reporting costs.** While visiting one defense contractor, the CIO mentioned how on-premise compliance and quality management systems had become siloed over time and of limited use except for one area of production. He explained it would cost over \$700K to get the on-premise system integrated with their enterprise-wide ERP system. Clearly having a cloud-based quality management and compliance system would avert the \$700K integration cost and reduce reporting workloads. Today this contractor manages International Traffic in Arms Regulation (ITAR) compliance with manual workflows despite having a quality management system in place.

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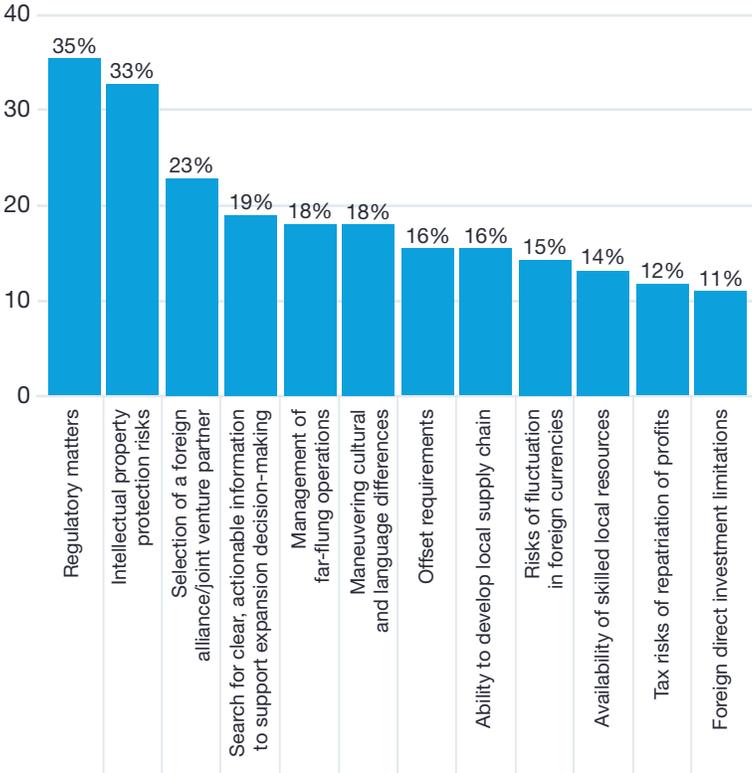
From the 2012 Global Aerospace & Defense Outlook also from KPMG, regulatory matters are the largest challenge to growing global operations, following by intellectual property protection risks. The graphic at the right shows the top challenges to global operations and expansion efforts of A&D manufacturers globally.

**2. Mobile Device Management (MDM) has moved beyond dashboard support for smartphones and tablets to being integral to product design and production management.** The two facets of mobility most affecting A&D include designed-in support for situational and battlefield awareness systems including Enhanced Position Location Reporting System (EPLRS) support and increasing reliance on mobility platforms for streamlining production data management including Computer-Aided Design (CAD) files supporting production.

**3. Reducing tooling costs using cloud-based platforms is accelerating.**

It is common to find up to 67 percent of total development cost for a given commercial aerospace contract being attributable to tooling costs. Cloud-based systems have been able to significantly reduce tooling time and costs by saving prior configurations and by being integral to calibrating machine tools on the production floor.

Top challenges to global operations and expansion efforts



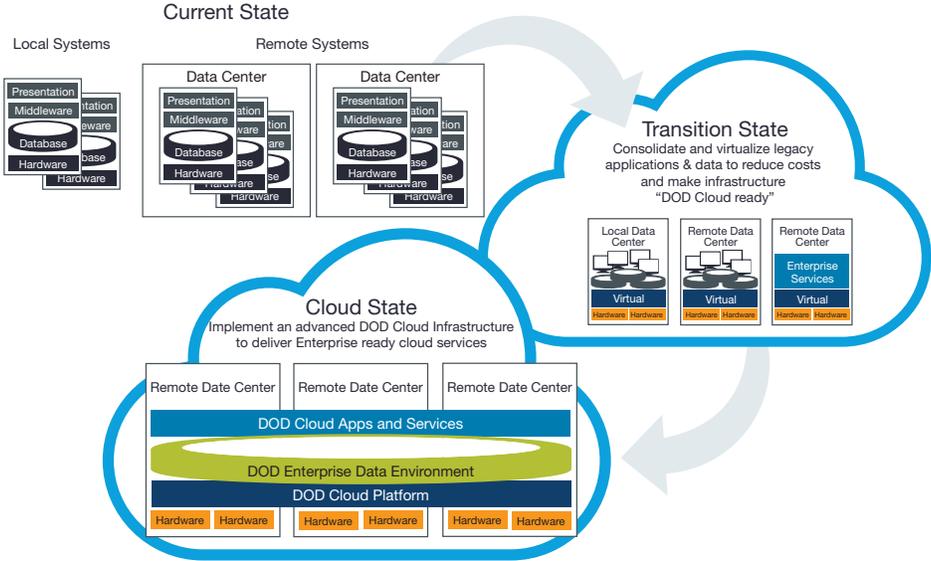
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**4. High priority placed on virtualized applications and data across the DOD including data centers with cloud-ready infrastructure supporting highly secured applications.** The DOD is planning for a transition state that includes consolidation and virtualization of legacy applications, many of which are very costly to maintain.

The graphic below shows the planned progression the DOD anticipates in migrating their data centers to an enterprise cloud infrastructure.

Consolidated Core Data Centers will Form the Basis of the Enterprise Cloud Infrastructure



**5. Chief Information Officers (CIOs) realize they must become strategists and move beyond being the caretakers of legacy systems if their careers are going to survive and thrive.** Resistance to change is very strong in many A&D companies, and often the systems running production can be decades old. CIOs and their staffs fall into a rut of being caretakers of legacy systems when what’s best for their careers is to push themselves past that role and into being strategists. Those CIOs who evaluate and adopt cloud technologies are often on the path to being strategists, as any investment in cloud applications requires tight alignment to strategic direction first. CIOs have confided that keeping legacy systems running can get pretty boring; they want a new challenge and a chance to contribute more.

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**6. The silent majority of cloud implementations in A&D are in highly secured vault areas and hidden from view in denied environments.** These systems are contained in secured clouds and are most often used in project management of advanced aerospace and defense engineer-to-order projects. They also often have entire project-based management systems running entirely secured within a given work area. Consortium and global-based product and program development projects are entirely managed on cloud-based systems behind multiple layers of security as well. These are the silent majority of cloud adopters in A&D.

**7. The A&D industry is losing patience with its “cylinders of excellence” as sequestration brings urgency to make collaboration pay.** Breaking down the silos that slow down collaboration and cross-project reporting and limit supply chain visibility is an especially high priority for many aerospace executives. As one jokingly called the “cylinders of excellence” the greatest impediment to growth, others have mentioned how cloud computing applications and platforms break these down by making data locked in legacy systems available project-, division- and company-wide.

**8. Department of Defense (DOD) requirements for cloud security are outpacing what commercial providers offer today, forcing a faster pace of innovation that benefits everyone.** Based on the comments from Lt. Gen. Ronnie Hawkins Jr. and from the many discussions held with CIOs and CEOs of aerospace suppliers, it’s clear that many of their requirements surpass off-the-shelf cloud security platforms today. In many cases, they surpass Service Level Agreement (SLA) levels as well, requiring custom development. This is good news for cloud computing overall as the DOD will continue to push for higher levels of security over time. SLAs, ITAR compliance, and AS 9100 Rev. C. compliance are just the beginning.

**9. Cloud-based consolidation of collaboration applications is the “low hanging fruit” of cost reduction in defense agencies.** As Lt. Gen. Ronnie Hawkins Jr. said, he looks to email consolidation and reliance on cloud computing to assist with a 20 percent reduction in costs for DISA.

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**10. Automating Maintenance, Repair and Overhaul (MRO) workflows using cloud-based systems that include mobility support are leading to reduction in inventory levels while service levels increase.** MRO is where the majority of A&D manufacturers make their highest gross contribution margins yet also have the greatest exposure to customer churn and attrition. Cloud-based MRO systems are being used today to enable MRO process performance gains by reducing inventories, increasing service levels, improving the design of service strategies and over time creating a more integrated MRO strategy corporate-wide.

## Conclusion

Cloud computing has the potential to completely revolutionize the A&D industry, with immediate cost gains from greater supplier collaboration and visibility, more effective demand management, and higher levels of compliance and quality management. The ability to pilot the use of cloud technologies to ascertain their value in your manufacturing environment is the place to start. Contact Plex today to see how you can gain the many competitive advantages that cloud-based manufacturing systems have in A&D manufacturing.

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