

Achieving Multi-Domain Convergence in Large-Scale Combat Operations

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The joint force is failing to achieve service interoperability and multi-domain convergence. Army Doctrine Publication (ADP) 3-0, Operations (2025), defines Multi-Domain Operations (MDO) as “the combined arms employment of joint and Army capabilities to create and exploit relative advantages to achieve objectives, defeat enemy forces, and consolidate gains on behalf of joint force commanders” (p. 25). This framework describes how the Army employs its capabilities in concert with the joint force to achieve joint objectives. ADP 3-0, Operations (2025), defines convergence as “an outcome created by the concerted employment of capabilities against combinations of decisive points in any domain to create effects against a system, formation, or decision maker” (p. 27).

Convergence results from collaboration and synergy among the components of the joint force, enabling them to achieve joint objectives. Convergence of joint force capabilities is a difficult concept to achieve, given the systems and interoperability challenges we face in today’s U.S. military. In practice, we face challenges in effectively and efficiently coordinating effects across echelons, domains, services, and commands. This article will examine these challenges and propose practical solutions to enhance interoperability and achieve multi-domain convergence. To successfully achieve multi-domain convergence in LSCO, the joint force must improve the fires and effects planning and synchronization process, enhance data sharing and interoperability, and modernize command and control systems.

Challenges to Multi-Domain Effects Convergence

Desynchronized Planning

Traditionally, fires and effects planning is very domain-centric, with each component developing its domain-specific plan primarily in isolation, and the plans then come together for the first time in the Joint Targeting Working Group (JTWG). From personal experience, observing and participating in Targeting Working Groups (TWGs) at the Division, Corps, and Theater echelons, I have found that the TWG is rarely an actual working group where plans are developed and synchronized. More often, the TWG serves as a rehearsal for the Joint Target Coordination Board (JTCB), where the Division, Corps, or Joint Force Commander approves the targeting and effects employment plan. This method is not a proper integration and synchronization of effects, which results in limited opportunities for convergence. In fact, Joint Publication (JP) 3-0 Appendix D, Fundamentals of Joint All-Domain Operations, acknowledges that previous joint doctrine sought to guide commanders in deconflicting operations rather than synchronizing efforts (JP 3-0 Appendix D, 2024). The consequences of lacking detailed and collaborative joint effects planning include inefficient resource utilization, missed opportunities for joint integration, and a failure to achieve convergence and create windows of opportunity for exploitation.

Interoperability Challenges

The joint force must reconcile interoperability challenges to achieve true convergence. Sharing data across domains, components, and with our allies is often inefficient due to incompatible systems within services, security protocol restrictions between partners, and a lack of common data protocol standards. Incompatible data formats or protocols make the sharing of targeting data difficult and, in some cases, incomplete. An example is the Air Force and Navy use of Link 16 J-series messages to communicate

targeting data to the Army, which primarily operates using VMF and USMTF data protocols. We operate on multiple networks to transmit information at varying security classifications and have established dedicated networks for communicating with partners and allies. The use of numerous security and message protocols, classification levels, and network architectures creates barriers to interoperability. The consequences of these interoperability challenges include delays in targeting and the passage of target quality data, as well as latent and incomplete situational awareness and dynamic coordination constraints.

Legacy Command and Control

The current legacy Command and Control (C2) systems used by the U.S. Army for the employment of effects and situational awareness are insufficient to coordinate complex multi-domain fires and effects. The Advanced Field Artillery Tactical Data System (AFATDS) and Joint Automated Deep Operations Coordination System (JADOCS) are the systems currently used by the U.S. Army. However, these systems do not use the same messaging format as our sister service's C2 systems. Furthermore, they cannot develop and coordinate fires and effects plans with the joint force. At best, these systems deconflict fires across domains. The consequence of this lack of interoperability between legacy C2 and mission command information systems (MCIS) is decreased situational awareness, slower decision-making, and the inability to rapidly and efficiently coordinate fires and effects across domains.

Proposed Solutions to Achieve Multi-Domain Convergence

Joint All-Domain Operations Planning

To mitigate these challenges to achieving multi-domain convergence, the joint force must establish Joint All-Domain Operations (JADO) planning teams at the Corps and above echelons. The JADO planning teams will consist of planners from each component, representing all five domains. Utilizing a JADO working group (JWG), planning teams will develop a JADO Concept of Operations (CONOPS) as input to the JTWG and JTCB. This function would be separate but entirely related to and follow the targeting cycle at echelon. Targeting establishes common objectives and coordinates targeting priorities. The JADO planners will then synchronize fires and effects and develop the CONOPS to achieve the joint force's goals. To ensure efficient and consistent collaboration across domains, the joint force must conduct regular joint training exercises and wargames utilizing JADO planning teams to improve coordination and interoperability.

Enhanced Data Sharing

The joint force, with its multi-national partners and allies, will never truly achieve convergence and synergy without adopting a shared network. A joint integrated data network uses common data standards and protocols to facilitate the flow of targeting data and enhance situational awareness across domains. The joint force is currently developing the Joint Fires Network (JFN) as part of its broader Combined Joint All-Domain Command and Control (CJADC2) initiative (Pomerleau, 2024). The JFN must be capable of receiving and distributing data across all classification levels (CUI, SECRET, TOP SECRET, CAP/SAP), parsing the data to each user at the appropriate level of classification in a "zero trust" manner. Intelligence and targeting data classified at the TOP SECRET (TS), Special Access Program (SAP), or Controlled Access Program (CAP) level would reside on the same network as SECRET data. Still, it would be accessible only to users with the appropriate security clearance and access. Data may be transmitted from a TS, SAP, or CAP system to a SECRET system, but only the data at the SECRET

classification would be visible to the receiver. This enhanced data-sharing network would streamline information sharing and reduce barriers to interoperability.

Modernized Command and Control

The joint force must modernize its current C2 systems infrastructure. Acknowledging that each service requires service- or domain-specific C2 systems, these systems must be compatible with one another to facilitate the interoperability required to achieve convergence. JADOCs is merely a deconfliction tool, and the Army is nearing fielding its replacement, the Joint Targeting Integrated Command and Coordination Suite (JTIC2S) (Kress, 2024). The systems of the future must incorporate AI and ML to increase efficiency, enhance situational awareness, and support rapid decision-making. Using AI to identify targets from streaming data, given specific Target Selection Standards (TSS) and a High-Payoff Target List (HPTL), will expedite the dynamic targeting process. ML using an Attack Guidance Matrix (AGM) to assign the quantity and type of effects to employ automatically will facilitate rapid decision-making for engagements with targets of opportunity. These systems should be capable of coordinating across domains and C2 within the JADO CONOPS to achieve true convergence.

Conclusion

In conclusion, to mitigate the challenges the joint force faces in effectively coordinating multi-domain effects across services to achieve convergence, a holistic approach to joint fires and effects convergence is necessary. The joint force must evolve its approach to planning and employing joint fires and effects, as well as modernize the data networks and C2 systems used to facilitate interoperability. To be successful, the joint force must prioritize improved fires and effects planning processes using JADO planning teams, enhance data sharing and interoperability through the Joint Fires Network, and field modernized command and control systems such as JTIC2S.

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