BREAKING DEFENSE / GAME CHANGER

JADC2 gets its first C2 gateway authorized to update itself

By BREAKING DEFENSE

Managing the level of data needed for multi-domain operations necessitates a C2 system that enables interoperability between fielded and new systems.

One of the holy grails of Combined Joint All Domain Command and Control (CJADC2) is having a C2 system that can be interoperable between all services and partners.

That means having a C2 gateway with the ability to communicate over all major tactical datalinks and emerging datalinks, such as Link-22. It means accepting a wide range of radar and sensor inputs to build a single integrated picture. And, of course, it must be cloud enabled with a containerized architecture that scales, and be software defined so it can be upgraded remotely for years to come without incumbent hardware costs.

Far from unattainable, though, these capabilities are all present today in the C2 gateway called ADSI. At 2,500 sites in more than 35 countries, ADSI is well-known for connecting the global multi-domain battlefield, translating and sharing diverse communications protocols and coalition partner data sources.

Newly modernized by Ultra Intelligence & Communications (I&C) for software-defined cloud-enabled C2 at the edge, and with the ability to constantly enhance mission effectiveness and interoperability through a continuous Authority to Operate (cATO), the ADSI of today is specifically engineered to support CJADC2 initiatives, enabling seamless coordination across concurrent, multi-theater support operations.

"As we look at what's happening in places like Ukraine and the Indo-Pacific, it's an incredibly complex threat environment that's quickly evolving," said Ultra I&C Chief Technology Officer Randy Fields. "Today we're still using all of the sensors that have been fielded for the last 30 years, while constantly adding new sensors, software, air platforms, and drones.

"Managing that level of data for multi-domain operations is going to require a resilient gateway that enables interoperability between those fielded systems and the new systems that come online. That's the sweet spot for ADSI because we maintain connectivity with all the legacy and fielded systems, while being able to adapt our platform rapidly to onboard new data types very quickly."

Configuring tactical datalink interfaces on the fly

Integrated air and missile defense (IAMD) along with its associated sensors and effectors is one area where complexity is growing exponentially, especially in the collection and processing of data necessary to counter threats from drones, ballistic missiles, and hypersonics.

"We are a core component within major missile defense systems and applications, and ADSI is one of the primary data routers to support interoperability with their sensors," said Fields. "It's a broker to take in any type of data we can get access to through a new front-end open API that enables us to be very extensible rapidly. That lets us continuously expand our full library with new messages and data types to continue to be that trusted broker between new types and fielded systems."

The continued and expanding value of ADSI for C2 in multi-domain operations was recently demonstrated during the NATO-led Coalition Warrior Interoperability Exploration, Experimentation, Examination Exercise (CWIX) in Bydgoszcz, Poland, in mid-2024 – which brought together fielded, developmental, and experimental systems under a coalition umbrella.

ADSI participated in the exercise as part of the Marine Corps Forces Europe and Africa team. It demonstrated forwarding and interoperability across coalition C2 systems by rapidly configuring tactical datalink interfaces to multiple nations on the fly.

Other accomplishments included facilitating data type conversions to enable integration of disparate systems by leveraging existing protocols, such as Cursor on Target (CoT) integration, CoT to Joint Range Extension Applications Protocol (JREAP-C) translation, JREAP-C forwarding and digital warfighting platform demonstration.

This was all done with the latest, modernized version of ADSI, which unifies the best of breed for the 21 different instances of ADSI created for different customers into a single baseline product.

Originally called the air defense system integrator, ADSI in its earlier incarnations was a processor that stood about chest-high that connected to radars and sensors with long cables. That's all been modernized to be just purely software, deliverable as containers to rapidly field and reprovision in modern cloud-native environments.

"We are flying inside surveillance platforms, we are inside of ships, we're inside missile defense platforms, and we're across air operations centers in a number of enterprise locations," said Fields. "We're truly edge-to-enterprise.

"Now that we've completed a major modernization effort for our mission application, our app can be delivered in containers and is streamlined for delivery to mobile devices."

On the cover: *The ADSI C2 gateway from Ultra Intelligence & Communications can communicate over dozens of tactical datalinks from Link 16 and NATO Link 1 to distributed systems datalinks. (Graphic courtesy of Ultra I&C.)*

An operator views C2 data from Ultra I&C's ADSI gateway on an Android Team Awareness Kit, ATAK. (Image courtesy of Ultra I&C)

For legacy ADSI, Ultra I&C provides the SyncNet8 serial-to-IP conversion appliance that enables fielded systems that are running analog to operate in a digital environment. That lets users keep their existing systems and stay interoperable, and also scale up in the future for any new systems and sensors that are brought online.

The importance of a continuous ATO

Earlier this year, ADSI became the first operational C2 gateway to earn a continuous Authority to Operate (cATO), enabling customers to quickly deploy into operational environments and maintain cybersecurity. Today it remains the only C2 gateway with an active cATO.

"Cybersecurity threats are evolving every single day," said Fields. "If I'm worried about my connectivity and the data that's on there, I would want to trust a platform that is earning its ability every day to be cyber secure versus another that is scanned periodically."

Continuous ATO lets Ultra I&C push validated code into production on an ongoing basis, resulting in shorter development cycles, quicker feature deployment, and reduced cost while providing a more secure capability for mission operations. This modernization milestone also resolves existing interoperability challenges among a large volume of datalinks, setting a new standard for data utilization in support of mission success. The accreditation was achieved following rigorous evaluation through Second Front Systems' Game Warden platform on the Operational Environment Data Integration Network (ODIN).

Ultra I&C is on systems that use DevSecOps pipelines and as new cybersecurity vulnerabilities are identified, the company has a fixed amount of time to respond. This is accomplished through secure cloud computing, and the ADSI cATO is also a historic first for a Cloud Based Command and Control (CBC2) gateway system. This enables operators to rapidly field ADSI and related system upgrades onto classified networks for immediate use.

Enabling digital workflows in CJADC2 objectives

Ultra I&C's ADSI is a software first, highly capable and flexible C2 system designed to meet the demands of modern warfare through enhanced interoperability, connectivity, and adaptability. It's poised to be the backbone for data-centric operations and multi-domain operations, and is enabling digital workflows in CJADC2 objectives.

Key capabilities of ADSI include: seamless data translation and transport across disparate systems and domains, including legacy and emerging platforms; advanced data brokering and AI-powered sense-making to amplify critical information for warfighters; and containerized and cloud-deployable architecture enabling scalability from tactical to enterprise levels.

Finally, the continuous ATO and focus on cost-competitiveness through a software-centric approach sets ADSI apart in the world of command and control.

"To attack those CJADC2 objectives, you have to be open, scalable, and truly cost competitive in this environment," said Fields. "By focusing on a software-first solution, we've streamlined operations, reduced complexity, and improved quality through standardization. We're positioned to better meet the need for the user across any cloud and any hardware environment with a highly competitive and modernized product."