Edge Node Systems: Improving Information Exchange When and Where it Matters Most

Rapidly delivering actionable GEOINT technology to warfighters

Concurrent Technologies Corporation (CTC) has successfully delivered thousands of customized IT solutions to the Intelligence Community (IC) and Department of War (DoW) for more than 20 years. Our deployed edge node systems bring current geospatial intelligence (GEOINT) data, applications, and services to coalition forces—much quicker and with less bandwidth.

- The mix of compute and data storage capabilities enables faster discovery of finished intelligence products and creation of new products based on recent foundation data.
- The use of applications and services reduces the need for specialized training for the deployed force.
- Hosting the applications and data locally—at the user level—minimizes the time it takes to produce intelligence products, plan and execute military operations—from weeks and days to hours and seconds.

How can this technology be used?

Examples of the potential use of edge node systems include providing the capabilities to find helicopter landing zones, conduct surveillance, locate targets, and assess damage. In the past, those on the front lines would have to reach back to the data centers in the U.S., which took too much time and bandwidth. Our system provides our military with the tools necessary to analyze and exploit intelligence and plan and execute operations faster than ever before.

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Supplying critical resources for operational decisions

In the context of data exploitation and analytic capabilities at the tactical edge, real value comes in supplying vital cognitive aids for operational decisions. These aids provide a significant advantage to those employing them, especially in tactical scenarios where planning and decision time is short and actions must be taken quickly.

Providing valuable machine learning capabilities in hostile environments

CTC's approach to Machine Learning (ML) and Artificial Intelligence (AI) is in sync with the U.S. Special Operations Command's (SOCOM) Hybrid Enabled Operator landscape, which resides at the intersection of the Cognitive, Digital and Physical Domains.

- We operate in contested environments that are very sensitive to security vulnerabilities—both defending ours and exploiting others' through forensic analysis of ML capabilities and weaknesses.
- We are developing ML capabilities that can help identify, track, and monitor version control where deep neural networks (DNNs) are most vulnerable.

CTC's Edge Node Representative Projects

Prototype Drone Target Recognition

CTC is prototyping a distributed network of agents in the form of quad-copter drones that use ML/DNNs target recognition on GPU platforms to recognize threats and communicate with one another over low bandwidth intra-swarm communications to share information and coordinate activity.

Identify Risk Mitigation through ML/AI

For an IC customer, CTC is researching cutting-edge ML/AI strategies, such as identifying risk mitigation techniques involving our model designs and training choices and how our adversaries can use those against us. This research also explores how mitigations against one type of attack may make the models more vulnerable to another type of attack. ML is deployed to the sensor—to prevail in highly contested Anti Access/Area Denial (A2AD) environments.

Commercial Cloud Services

CTC is one of the first companies to develop and achieve Authority to Operate (ATO) and deploy an operational system within the Commercial Cloud Services (C2S) classified government cloud.

GEOINT Capabilities for Warfighters

We are providing warfighters with a tailored set of GEOINT capabilities across many Combatant Commands (COCOMs)–capabilities focused on current operations and critical intelligence needs.

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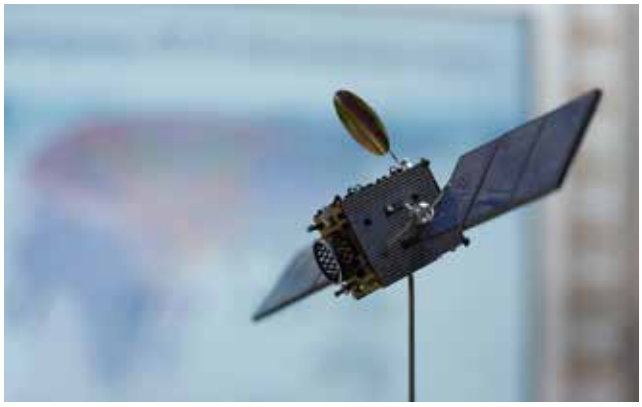
CTC's Edge Node Representative Projects (continued)

Small Satellite Support

CTC is developing and deploying a cloud-based mission management, processing, and exploitation system for the U.S. Army Space and Missile Defense Command (SMDC). This system is designed to use small satellites to fill the deep sensing and targeting gap. We deployed algorithms originally developed for national systems and adapted them for a small satellite system with a similar mission and capabilities.



Cross Domain Solutions

We have provided offensive and defensive cyber capabilities for multiple IC customers for decades. Our cross domain solutions, which have proven more successful than any other guard technologies in the initial identification of cyber threats, have been deployed globally.

Safe Transmission of Classified Data

We are providing and maintaining secure communication and mission management technology that allows safe transmission of classified data for yet another IC customer.

Interoperability between C2S and Edge Nodes

CTC produced and delivered courses of action (COAs) relating to C2S migration, along with a number of recommendations for hardware-refresh options, to improve the interoperability of warfighter support applications. Our recommendations enhanced interoperability between C2S and Edge Nodes and automated Wide Area Motion Imagery (WAMI) processing and data availability. The strategic goal is to reach one-for-one, collection-to-user delivery timelines.

CTC is rapidly developing game-changing edge node solutions for the Department of War (DoW) and Intelligence Community (IC)

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Concurrent Technologies Corporation

Concurrent Technologies Corporation (CTC) is an independent, nonprofit, applied scientific research and development professional services organization. CTC collaborates with its technology transition affiliate, Enterprise Ventures Corporation, to leverage research, development, test and evaluation work to provide transformative, full life-cycle solutions. To best serve our clients' needs, we offer the complete ability to fully design, develop, test, prototype, and build. We deliver robust, technical, and innovative solutions that safeguard our national security, retain U.S. technological advantage, and ensure the primacy of American manufacturing.

Quality Commitment | Concurrent Technologies Corporation (ctc.com)

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