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# Tactical ISR/C2 Integration with AI/ML Augmentation

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Monterey, California: Naval Postgraduate School

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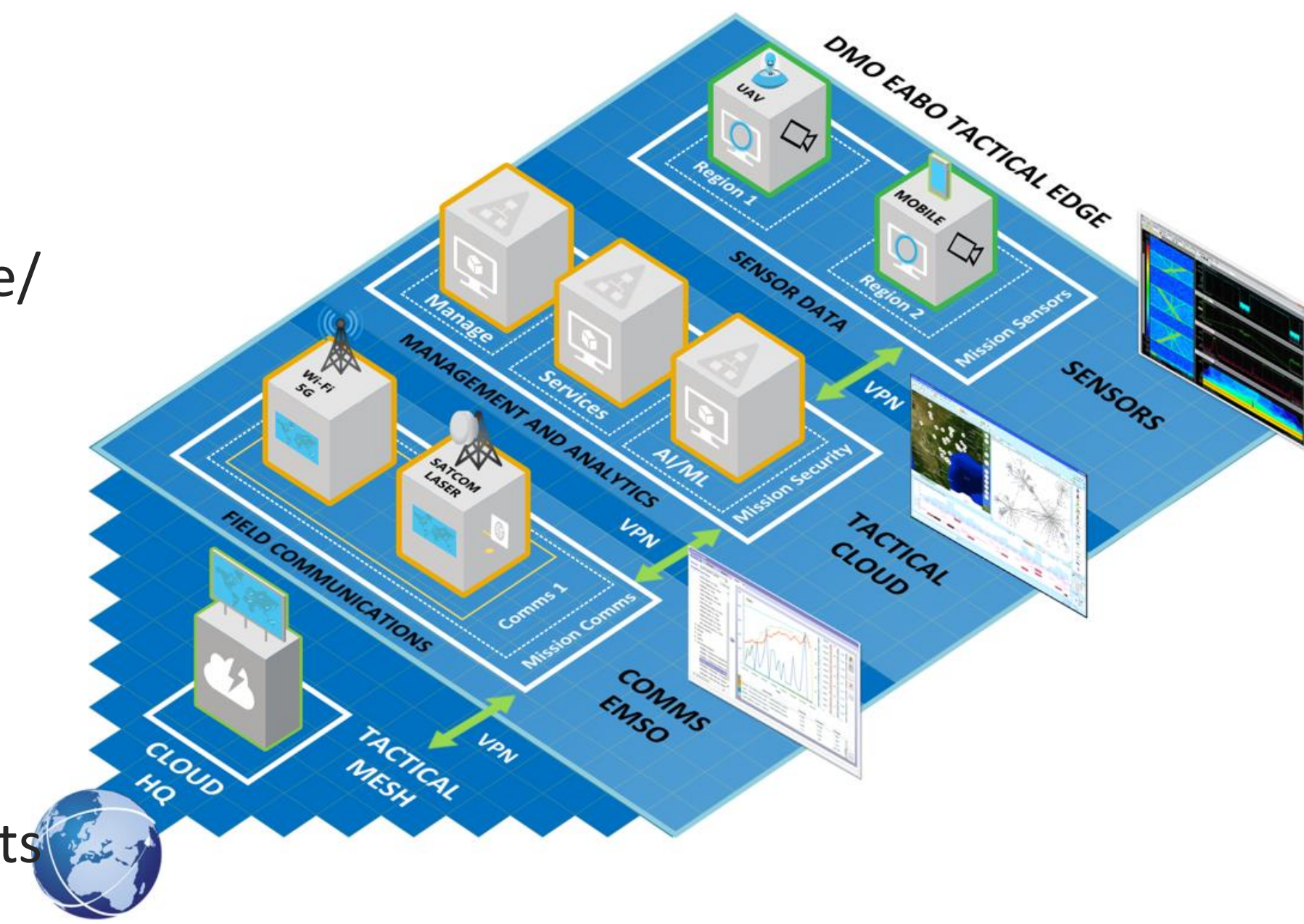
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## Project Summary

NAVPLAN 2021 and 2022 specify Distributed Maritime Operations (DMO) with a tactical grid to connect distributed nodes with Artificial Intelligence/Machine Learning (AI/ML). The architecture will support:

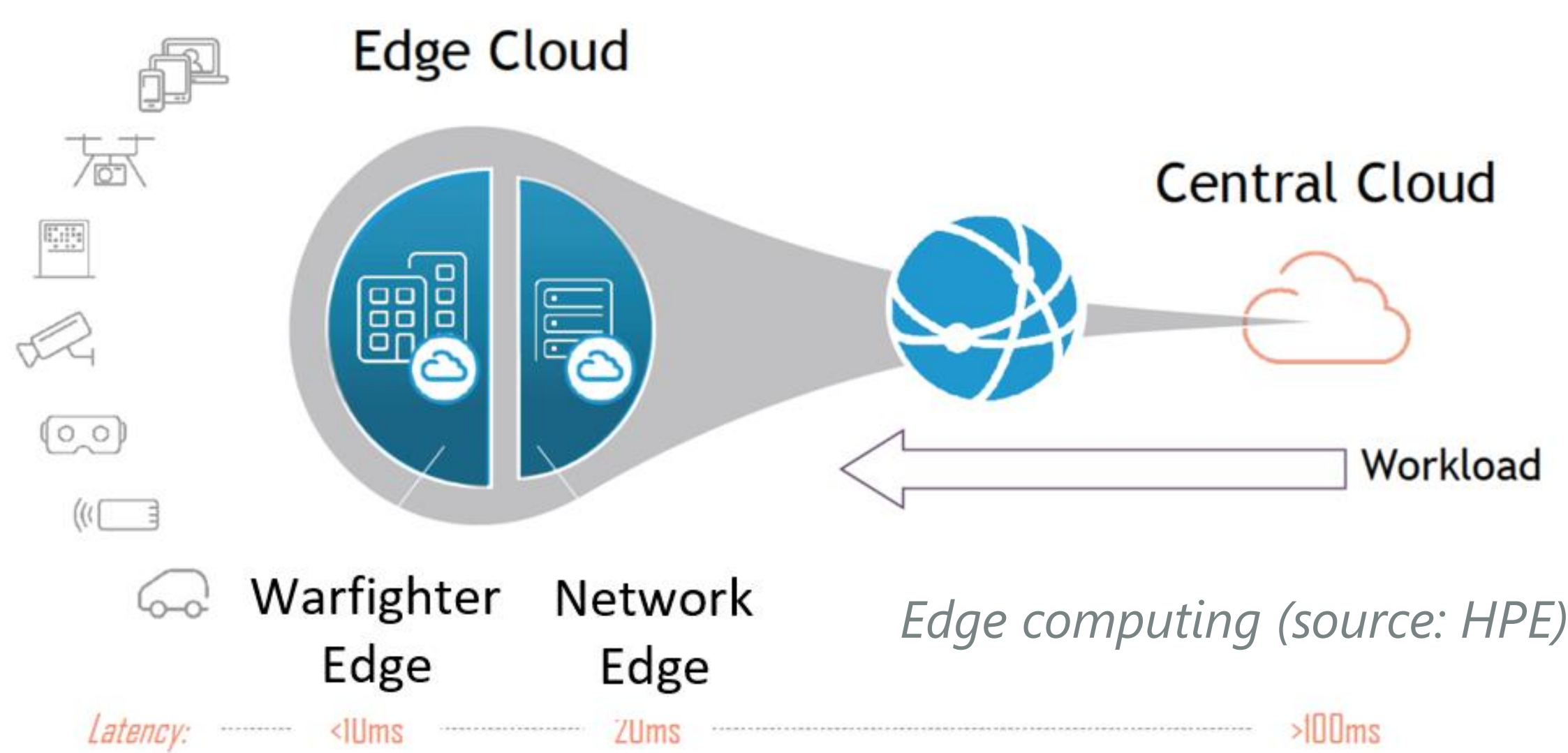
- Expeditionary Advanced Base Operations (EABO)
- Littoral Operations in a Contested Environment (LOCE)
- Joint All-Domain Command and Control (JADC2)

The Intelligence, Surveillance and Reconnaissance (ISR) and Command and Control (C2) hardware and software have yet to be fully integrated and the configurations tested. This research provides baseline assessments for hybrid tactical cloud hardware and software infrastructure, and integrated C2/ISR services, for a universal COP.



Forward deployed tactical cloud services

## Research Objectives



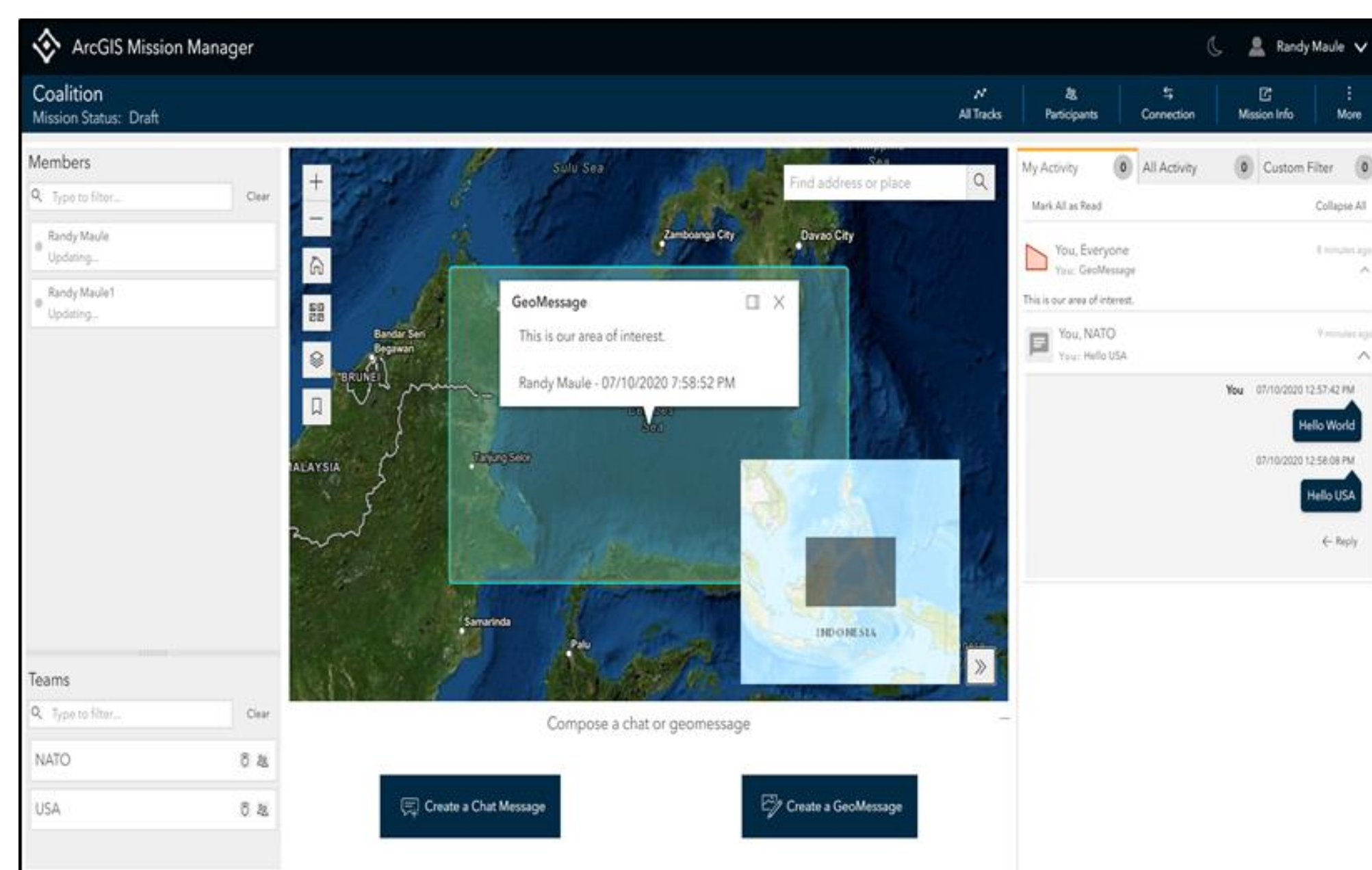
Evaluate options for ISR and C2 integration into a universal Common Operational Picture (COP):

- Hardware Infrastructure: Tactical cloud hardware and deployment options
- Software Infrastructure: Hybrid tactical cloud software and implementation
- Apps and Services: Integrated C2/ISR to support a universal COP – HQ to the far tactical edge
- AI/ML for automation and decision support.

## Findings and Conclusions

This research informs DMO, EABO, LOCE and JADC2 objectives with technical analysis of integrated C2 and ISR services and supporting hardware infrastructure, hybrid multi-cloud software, and AI/ML for a universal COP:

- Hardware to support distributed tactical cloud edge services at commands and on user mobile devices
- Hybrid multi-cloud software for distributed computing in high security architecture for D-DIL, EMS, GPS, and cyber challenged environments
- Industry and government solutions for an integrated C2/ISR universal COP to support legacy and JADC2 sensors and services
- AI/ML micro-service mesh on real-time streaming architecture for tactical edge automation and decision support for a C2/ISR universal COP.



source: ESRI



Mission command portal, user mobile application, and streaming services

## Future Work

Refine the hardware and software for lightweight tactical clouds suitable for extreme edge deployments in challenged environments to support an integrated C2/ISR universal COP with AI/ML services at the far edge including analytics for advanced situational awareness, automation and prediction.



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**Topic Sponsor:** Commander, Naval Surface Forces (CNSF)

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