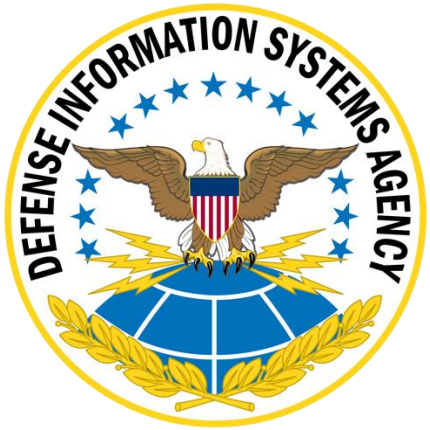

TEM PRESENTATION

EDGE AI/ML Data Center POD technology

ADACEN

April 1, 2025

CHALLENGE

The Defense Information Systems Agency (DISA) is at the forefront of modernizing the DoD's AI/ML infrastructure to support warfighter decision-making, cyber defense, and real-time intelligence processing. However, several challenges hinder AI/ML adoption within DISA's data centers and mission-critical environments:

- ✓ Legacy AI/ML MOD/SIM Infrastructure – Existing data centers lack the high-performance, scalable, and energy-efficient compute required for modern AI and Simulation workloads
- ✓ Cloud Dependency & Security Risks – Reliance on commercial cloud solutions increases data sovereignty concerns and vulnerabilities to cyber threats
- ✓ Compute Latency & Bottlenecks – Centralized cloud-based AI inference introduces delays, limiting real-time battlefield and cybersecurity response capabilities
- ✓ High Power Consumption & Sustainability Challenges – Traditional air-cooled data centers require massive energy resources, with cooling accounting for 40%+ of power usage, and have a significant water reliance vulnerability too

"Adacen's Edge AI/ML Data Center PODs deliver real-time AI processing and accelerated decision-making at the edge — reducing latency, increasing operational security, and cutting energy costs by over 50%"

Solution: AI/ML Modernization with Immersion-Cooled Edge Data Centers

Our solution modernizes DISA's AI/ML MOD/SIM capabilities by integrating high-performance, energy-efficient, and sovereign AI infrastructure at the edge.

- ✓ Immersion Servers – AI/ML (GPU) & MOD/SIM (CPU) -optimized compute nodes, enabling real-time model training and inference with minimal power consumption
- ✓ PODs – Modular, immersion-cooled micro data centers designed to enhance AI processing efficiency while reducing energy costs by up to 50%
- ✓ Nomads – Portable, high-density edge AI/ML clusters for classified installations, forward-operating bases, and remote DoD facilities
- ✓ OS Software – AI/ML MOD/SIM workload orchestration for intelligent resource allocation, automated scaling, and real-time data processing
- ✓ AI Software – Accelerated AI capabilities of meeting the rigorous demands of government operations, emphasizing security, accuracy, speed and scalability

"Adacen's solution integrates high-density Hypertec immersion servers, Submer PODs, and portable DUG Nomads, orchestrated by Hoonify TurbOS and Pryon's AI platform — delivering scalable AI processing with 50% less power consumption and sub-millisecond response times"

Key Benefits for DISA's AI/ML Modernization

Secure, On-Prem AI/ML Compute for DoD Applications

- ✓ On-prem, immersion-cooled AI processing eliminates public cloud dependency for classified AI workloads
- ✓ Sovereign AI infrastructure ensures mission security and compliance with DoD Zero Trust Architecture (ZTA) initiatives

High-Density AI Compute with Lower Latency

- ✓ Edge AI processing reduces decision-making latency from minutes to milliseconds, critical for ISR, cyber defense, and command-and-control (C2) operations
- ✓ Optimized for AI inference and training, supporting large-scale deep learning, NLP, and geospatial AI analytics

Key Benefits for DISA's AI/ML Modernization – Cont.

Energy Efficiency & Sustainability

- ✓ 50%+ reduction in total power usage using liquid immersion cooling instead of traditional HVAC-based cooling
- ✓ Sustainable AI/ML infrastructure aligns with DoD's climate resilience and green IT initiatives

Scalable AI/ML Infrastructure for DISA's Evolving Needs

- ✓ PODs & Nomads can be rapidly deployed at military bases, intelligence centers, and cyber command sites
- ✓ AI-driven network automation enables real-time optimization of DoD's information networks (DODIN)

"Unlike traditional data centers, Adacen's immersion-cooled PODs reduce latency to microseconds, increase compute density by 10X, and operate with a PUE of 1.03 — ensuring unmatched performance and efficiency"

Technology Readiness Level (TRL)

Technology Readiness Levels (TRLs) are a scale from 1 to 9 used to measure the maturity of a particular technology. Developed by NASA in the 1970s, TRLs provide a clear framework to understand and communicate the progress of technology development. Here's a brief overview of each level:

- ✓ **TRL 1:** Basic principles observed and reported
- ✓ **TRL 2:** Technology concept and/or application formulated
- ✓ **TRL 3:** Analytical and experimental critical function and/or characteristic proof of concept
- ✓ **TRL 4:** Component and/or breadboard validation in a laboratory environment
- ✓ **TRL 5:** Component and/or breadboard validation in a relevant environment
- ✓ **TRL 6:** System/subsystem model or prototype demonstration in a relevant environment
- ✓ **TRL 7:** System prototype demonstration in an operational environment
- ✓ **TRL 8:** Actual system completed and qualified through test and demonstration
- ✓ ***TRL 9: Actual system proven through successful mission operations***

"Liquid Immersion based High-Performance Compute (HPC) running Super Compute (SC) codes in both centralized and edge AI/ML Mod/Sim solutions have been deployed and are operational on prem and in private cloud instances commercially as well as in DOE National Laboratories"

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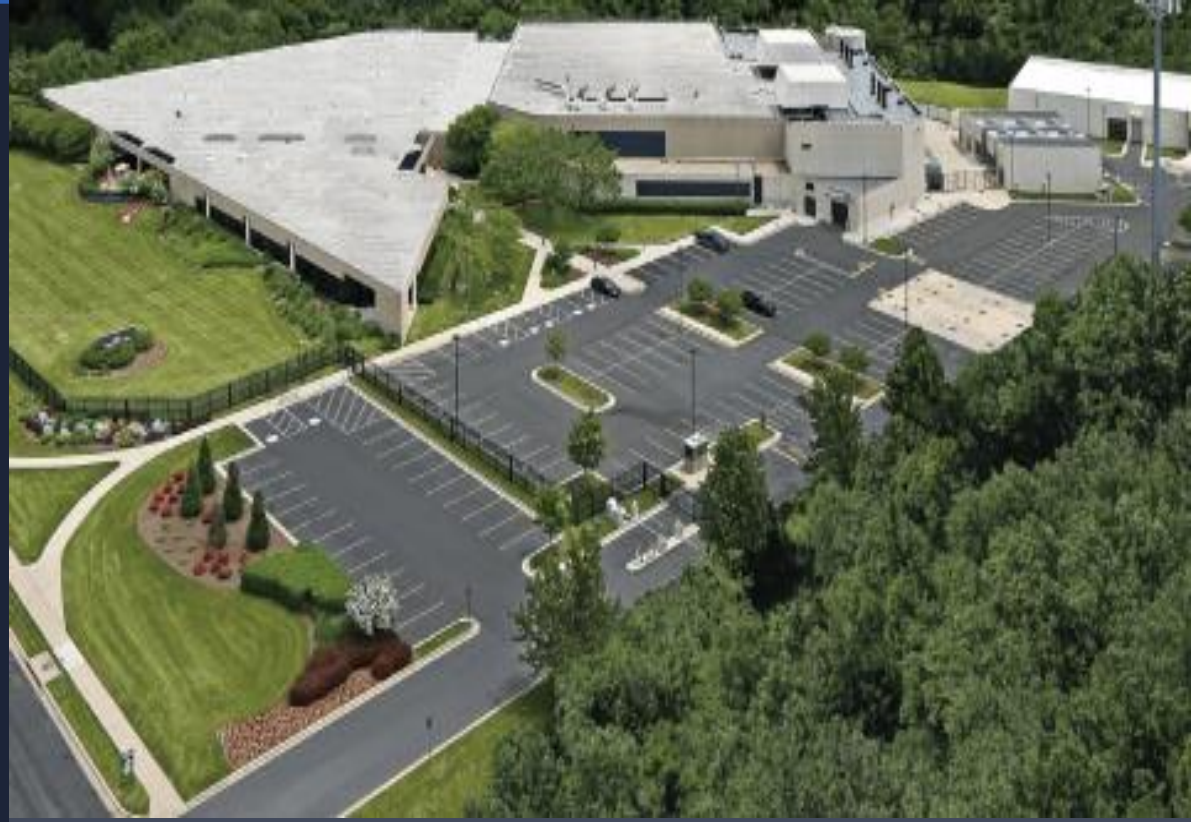


Company Overview

ADACEN SERVICES

1

NETWORK

- Private-Secure Core Network
- Route Diversity
- Diverse Entrances
- 800Gb meshed WAN
- HA DIA w/BGP
- Extended WAN (featuring Quantum Safe Encryption)
  - Fiber
  - Satellite
  - Wireless

2

COLOCATION

- Legacy Cabinets
- Immersion PODs
- Cooling
- Dual PDUs
- Network Ports
- Cross Connects
- Smart Hands
- NOC
- Office Space

3

CLOUD

- SCaaS
- HPCaaS
- IaaS Compute
- IaaS Storage
- Bandwidth
- Managed Firewalls
- BaaS
- DRaaS
- MDR
- IR

ADACEN

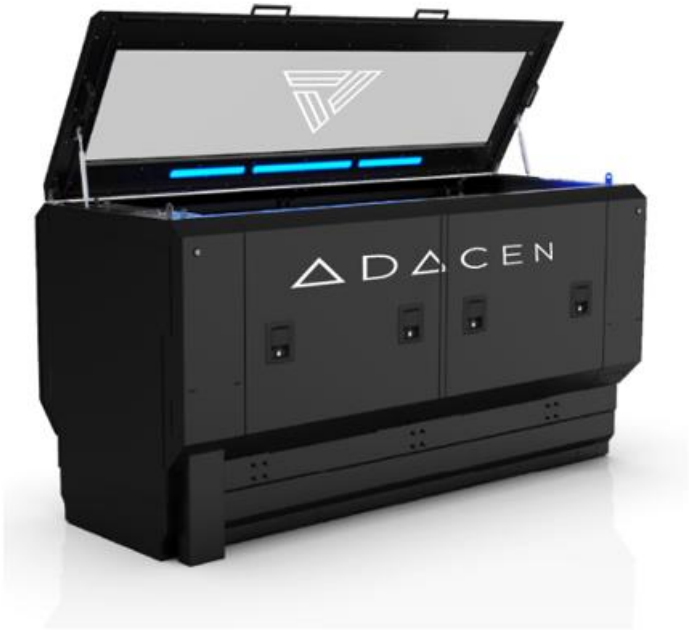
Advanced Solutions Detail

- **Performance**
- Efficiency
- Security
- Scalability
- Mobility

Performance

High-Performance Compute (HPC) & Private HPC Cloud

- Next-generation HPC through immersion cooling
- ADACEN Private HPC Cloud – emphasis on AI/ML as-a-service
- Turn-key solutions for data center, edge compute & private 5G



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Advanced Solutions Detail

- Performance
- **Efficiency**
- Security
- Scalability
- Mobility

Efficiency

Immersion Cooled Server Technologies

- Reduce data center power consumption - PUEs drop from 1.50 to 1.03
- Unlock powerful HPC in a high-density compute form factor
- Eliminate the recurring use of water for cooling
- Reduce compute power consumption when fans are not applicable
- Extend hardware life via the clean & stable immersion environment
- Silence existing loud noise levels in the data centers
- Unlock substantial cost savings across many touch points

ADACEN

Advanced Solutions Detail

- Performance
- Efficiency
- **Security**
- Scalability
- Mobility

Security

Ideal for Quantum Safe Encryption Technologies

- Designed with HPC in mind
- Pass encryption keys out of band / off-axis
- ADACEN will have a classified / unclassified capability at North Site

ADACEN

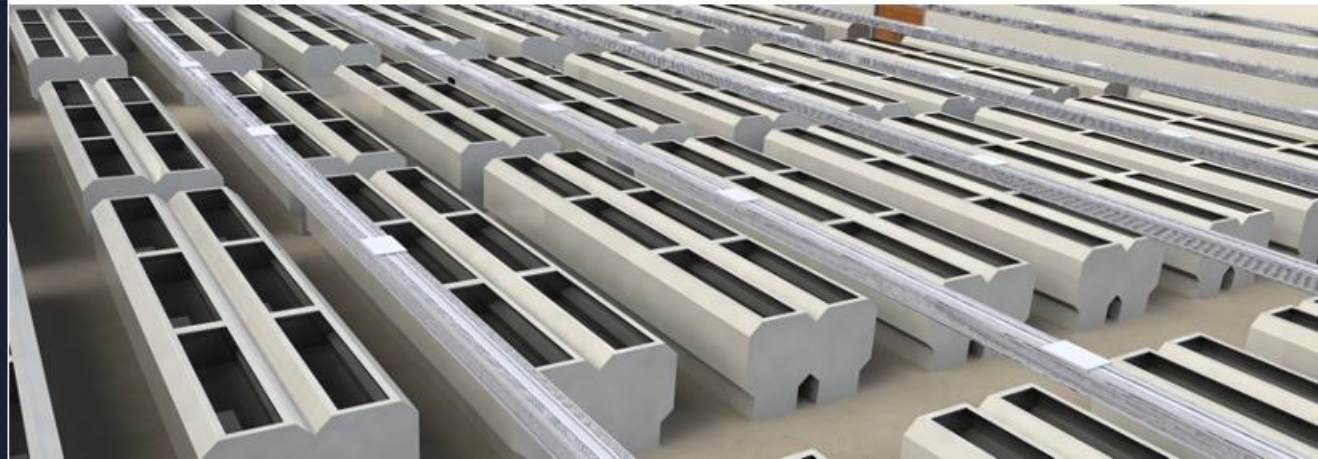
Advanced Solutions Detail

- Performance
- Efficiency
- Security
- **Scalability**
- Mobility

Scalability

Grow and Scale with Simplified Footprints

- Immersion data centers are 10x less in size than legacy buildings
- Simplify infrastructure with simple and cost-effective buildings
- Eliminate the need for raised floor, high ceiling & other costly items
- Repurpose existing buildings, storage space and other locations
- Bring compute to the edge and hard to reach locations
- High-density environment also reduces compute needs



Data Center Immersion Conversion

ADACEN designs, develops and operates highly resilient Data Oasis™ locations. These advanced data center campuses are designed for data superiority – delivering unprecedented data center resiliency and protection via power, physical and network differentiators.

Data Oasis™ is designed to support the United States Government and US-owned Enterprise companies that are critical to the continuity of society – including energy, intelligence, defense, financial, infrastructure, health care, technology, transportation and others.

In the case where our clients cannot use our Data Oasis™ facilities, ADACEN has adapted our efficiency-based technology solutions to create a client site conversion solution bringing numerous benefits usually afforded in our facilities to our client's premises or remote activities. This conversion solution enables significantly more compute in a much smaller space, using less power and little to no water.

Conversion Benefits

- 1/10th the Space is needed
- 1/3rd less Power is needed
- 98% Less use of Water
- Eliminates Computer Room Air Conditioning (CRAC) Units
- Simplifies Environmental Control
- Simplifies Fire Control
- Enables Ultra High-Density Compute
- Enables Ultra High-Density Storage
- Fully Contained Environment
- Fixed or Mobile Options
- Supports Legacy or New Technologies

Adacen's Ultra Green Solutions Save Money & Time

95%

Reduction in Cooling Costs

- ✓ Power Usage Efficiency of 1.03 (third party certified)
- ✓ ROI < 1 year

50%

Reduction in CAPEX build costs

- ✓ Rapidly deployable in raw space without need for raised floors nor cold aisles with minimum retrofitting required for existing DCs

40%

Reduction in Power Consumption

- ✓ 10X Increase in Computing Density
- ✓ Over 100kW in the space of 2 standard racks

30%

Increase in Hardware Lifespan

- ✓ No moving parts
- ✓ No dust particles
- ✓ No vibration
- ✓ More even heat dissipation

CAPABILITIES OVERVIEW

EDGE AI/ML Data Center Technology

Proximity to Data Source

- ✓ Edge AI/ML Data Center PODs eliminate this bottleneck by enabling real-time AI inference and model training directly at the source

Real-Time Decision-Making

- ✓ AI-powered systems can make autonomous decisions without needing to wait for cloud-based processing

Reduced Latency

- ✓ Latency reduction from milliseconds to microseconds enables faster responses for: ISR (Intelligence, Surveillance, Reconnaissance), Threat detection, Autonomous systems, Cyber defense

Improved Bandwidth Efficiency

- ✓ Frees up bandwidth for other mission-critical communications

Scalability and Portability

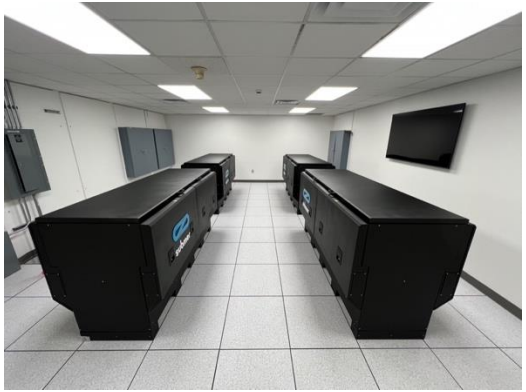
- ✓ Modular and portable POD design allows rapid deployment in remote, high-risk, or resource-limited environments such as Forward operating bases, Remote intelligence sites, Mobile tactical command centers

Definition and Purpose: EDGE AI/ML MOD/SIM Data Center PODs enhance efficiency by bringing computational power closer to the data source

Importance: These systems offer real-time processing and improve data access to multiple government and intelligence agencies

Key Technologies in EDGE AI/ML PODs

- ✓ **Immersion Servers** – AI/ML-optimized compute nodes, enabling real-time model training and inference with minimal power consumption
- ✓ **PODs** – Modular, immersion-cooled micro data centers designed to enhance AI processing efficiency while reducing energy costs by up to 50%
- ✓ **Nomads** – Portable, high-density edge AI/ML clusters for classified installations, forward-operating bases, and remote DoD facilities to improve battlefield analytics
- ✓ **Operating System Software** – AI/ML workload orchestration for intelligent resource allocation, automated scaling, and real-time data processing
- ✓ **AI Software** – Accelerated AI capabilities of meeting the rigorous demands of government operations, emphasizing security, accuracy, speed and scalability



Advantages of EDGE AI/ML Data Center PODs

- ✓ **Latency:** Sub-millisecond inference and decision-making
- ✓ **Energy:** 50% lower power consumption
- ✓ **Compute Density:** 10X increase in AI/ML compute capability
- ✓ **Security:** On-prem AI processing for classified workloads
- ✓ **Deployment:** Portable, rapidly deployable in forward-operating bases

Immersion born GPU Server

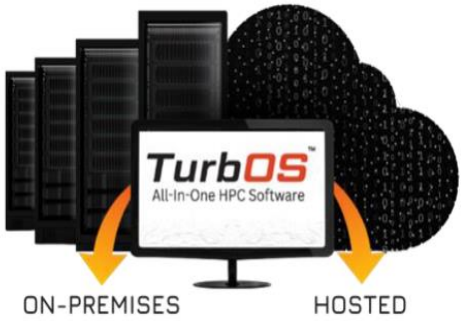
HOONIFY: Advanced OS Software for the Edge

TurbOS
All-In-One HPC Software

Hoonify distills the DNA of a supercomputer into TurbOS™, delivering **on-demand, simplified,** and **affordable** high-performance computing (HPC) capabilities, including:

- Parallel Computing
- High Performance Optimizations
- Rapid Provisioning
- Robust Security
- Cluster Management and Scheduling

Solutions to Fit Your Needs



Hoonify Technologies:

Defense at the Edge

TurbOS Delivers and Optimizes ANY Supercomputing Application Including:*

SABLE
A modernized shock hydrodynamics code leveraging optimized supercomputers

CTH / radCTH
Large shock and deformation solid mechanics code for multi-phase, elastic, viscoplastic, porous and explosive materials

MCNP
Monte Carlo N-Particle code used in nuclear criticality safety, reactor design, and radiography

LAMMPS
A classical molecular dynamics code with a focus on materials modeling

PARAVIEW
The world's leading open-source post-processing visualization engine.

XPATCH
Prediction & analysis tool that uses the shooting-and-bouncing (SBR) method to predict realistic far-field and near-field radar signatures for 3D target models

*Additional applications available upon request

PRYON: Integration with Specialized AI Software

Enhanced Accuracy and Precision

- ✓ Pryon's RAG platform excels in delivering factually accurate, contextually relevant responses by combining generative AI with a retrieval layer that dynamically sources verified information.

Real-Time Information Retrieval

- ✓ Integrates directly with **live data repositories**, enabling **instant access to updated content** without extensive model retraining.

Improved Knowledge Management

- ✓ Ingests, indexes, and structures **unstructured data** from documents, PDFs, manuals, and internal knowledge bases.

AI-Powered Automation for Complex Workflows

- ✓ Empowers AI/ML systems to deliver insights for: **Cybersecurity threat analysis, Operational planning and logistics, Compliance and risk assessment Security and Data Control**
- ✓ Platform supports on-premise, air-gapped, and hybrid deployments, ensuring data sovereignty for organizations like DoD, DISA, and classified environments.

Pryon: Accelerated AI capabilities of meeting the rigorous demands of government operations, emphasizing security, accuracy, speed and scalability

"Pryon's RAG platform enhances AI model accuracy by 30% through real-time data retrieval, ensuring operational decisions are based on the most current intelligence — even in disconnected or low-bandwidth environments"

USE CASES

Sandia National Laboratory

SANDIA REPORT SAND2024-16266 Printed December 2024

Immersion cooling is the next inflection point for HPC environments because it has the potential to fully eliminate all mechanical or compressor-based cooling. Immersion cooling is the latest instantiation of cooling technology that is being demonstrated at Sandia. It sets itself apart from other cooling technologies due to its ability to reject a large amount of heat from computing environments at very high temperatures. This not only reduces energy usage but enables possibilities for heat recovery and reuse for other applications that were previously not available with
legacy technology.

Several technical advantages with immersion cooling technology exist. A summary of these
advantages follows.:

- Immersion cooling allows for greater computing density relative to the floor space utilized with legacy HPC technology.
- Immersion cooling produces almost no noise, where legacy HPC environments suffer from computing fans that can often exceed OSHA limits.
- Heat rejection to the ambient environment is very small. This limits the HVAC unit size to that which provides cooling and fresh air for human comfort.
- By more efficiently cooling the computing equipment, CPUs and GPUs can be utilized beyond 100%. With air cooling, processors are often throttled to prevent overheating.

NorthStar Medical Radioisotopes

NorthStar Medical Radioisotopes is a global innovator in the development, production, and commercialization of radiopharmaceuticals used for therapeutic and medical imaging applications. Their mission has positioned them as an emerging leader at the forefront of U.S. medical radioisotope research, heavily relying on computational modeling, such as MCNP simulations, to optimize their development services. However, NorthStar faced several critical challenges in their pursuit of computational excellence:

- **Scalability Costs**
- **Underperforming Hardware**
- **Long Simulation Times**
- **HPC & MCNP Professional Services**

Simulation runtimes were reduced from several days to just a few hours, significantly accelerating development timelines. Quicker turnaround times facilitated earlier-stage clinical trials and exploration of more advanced simulation models.

"Time is our biggest enemy. Having an optimized system that provides accurate results and a 100 percent improvement in simulation performance is critical. Analysis is the bottleneck in our pipeline, and this improved HPC performance significantly enhances our workflow efficiency, helping NorthStar innovate faster and maintain our competitive edge."
– Josh Peterson-Droogh, Nuclear Engineering & Physics Manager at NorthStar Medical Radioisotopes

CALL TO ACTION

"Adacen and Team's Edge AI/ML MOD/SIM PODs provide DISA with a secure, sovereign infrastructure that accelerates decision-making and enhances mission effectiveness. Contact Adacen today to schedule a pilot deployment and immediately transform edge AI capabilities"

FLEXIBLE DEPLOYMENT OPTIONS

- Federal Cloud
- On-Prem
- Air-Gapped
- Private Cloud

- ✓ Impact Levels 4, 5, and 6
- ✓ Top Secret
- ✓ FedRAMP access

Game Warden

DEMO

Q&A

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