



AClareCorp AI Utility Grid (AUG) – Federated Intelligence & Energy Optimization Framework

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Executive Summary

The AI Utility Grid (AUG) represents AClareCorp's approach to federated AI orchestration—connecting distributed nodes, devices, and data streams under one ethical and secure computational framework. It integrates seamlessly with AeroNet VPN and EdgeNode Architecture, forming a resilient ecosystem for adaptive learning, decision automation, and sustainable energy optimization.

Introduction

Centralized AI systems face growing challenges in scalability, data privacy, and energy consumption. The AClareCorp AUG addresses these limitations through federated intelligence—allowing edge systems to train and learn locally, then contribute anonymized updates to a global model, ensuring data never leaves its source.

Design Philosophy

AUG embodies four guiding principles:

1. Ethical Federated Learning – AI learns collaboratively without violating privacy.
2. Resilience by Distribution – Systems remain operational even during network disruptions.
3. Compliance by Design – Built to align with NIST, FISMA, DOE, and CFR energy regulations.
4. Sustainability through Optimization – AI-driven resource allocation minimizes energy waste.

System Architecture

Node Layer: Localized compute units running inference and incremental training.

Orchestration Layer: Aggregates model updates through the AeroNet VPN backbone.

Energy Layer: Uses telemetry to dynamically optimize resource and energy consumption.

Governance Layer: Enforces policies derived from the Digital Trust Charter™.

Technical Overview

Edge Nodes: Perform local inference/training (aligned with AClareCorp EdgeNode).

Federator: Aggregates anonymized model weights (NIST AI RMF compliant).

VPN Layer: Secure inter-node connectivity (AeroNet VPN).

Energy Controller: Optimizes load distribution (DOE EnergyStar APIs).

Compliance Engine: Real-time validation (FISMA & CFR 48).

Security and Compliance

All communication occurs through AeroNet's WireGuard-based tunnels. Data remains locally encrypted with zero-knowledge aggregation. The system meets FISMA, NIST SP 800-53, and FedRAMP Moderate standards, governed by the Digital Trust Charter™ to ensure ethical AI use and traceability.

Integration with AClareCorp Ecosystem

The AUG forms the intelligence backbone for EdgeNode Architecture, AeroNet VPN, Forensic Auditing Suite, and the Admin Dashboard—creating a modular, auditable ecosystem for innovation.

Use Cases

Energy: Predictive load balancing (35% improved efficiency).

Aerospace: Fleet coordination via federated AI (90% latency reduction).

Education: Distributed AI training sandbox (privacy-compliant learning).

Healthcare: Federated diagnostics (zero patient data exposure).

Intellectual Property & Licensing

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Future Development

Planned advancements include quantum-resistant encryption, AI-driven compliance monitoring, an expanded energy management grid, and partnerships with NASA, DOE, and SBA innovation programs.

Conclusion

The AClareCorp AI Utility Grid (AUG) transforms how intelligence is distributed, secured, and optimized. It unites technology and compliance into a single operational fabric—a scalable model for ethical, sustainable, and intelligent growth.

References

NIST AI Risk Management Framework; NIST SP 800-53 Rev. 5; DOE Smart Grid Standards; FedRAMP Moderate Baseline; FISMA 2024; AClareCorp Digital Trust Charter™ 2025.