



AClearCorp AI EdgeNode Architecture: Technical White Paper and Implementation Framework

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Date: October 2025

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Executive Summary

AClearCorp's AI EdgeNode Architecture establishes a federated, zero-trust computing framework designed for real-time data intelligence at the network edge. It integrates secure communication (via AeroNet VPN), on-device AI inference, and compliance-grade telemetry within a modular system deployable across aerospace, defense, energy, and enterprise sectors.

Introduction

Modern operations rely on distributed systems capable of processing data where it's generated. AClearCorp's EdgeNode Architecture places AI inference, decision-making, and encryption at the edge, supported by a central orchestrator for coordination and policy management.

System Design and Architecture

The architecture consists of a Core Orchestrator, Edge Nodes, AeroNet VPN Backbone, and Zero-Trust Framework ensuring continuous authentication and secure data flow.

Technical Implementation

Built in Python with FastAPI, MQTT, and WireGuard integration. Uses ONNX/PyTorch runtimes for inference, Terraform for deployment, and Prometheus for monitoring.

Compliance and Security Posture

Aligned with NIST SP 800-53, FISMA, FedRAMP Moderate, and FAR 9.104-1 criteria. Built for audit-ready environments and compliance assurance.

Use Cases and Mission Applications

Applicable across aerospace, energy, healthcare, and education for real-time analytics, energy efficiency, and data security.

Intellectual Property & Licensing

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Future Development and Scalability

Roadmap includes AeroNet VPN production rollout, federated AI orchestration, SBIR readiness, and integration with the Admin Dashboard suite.

Conclusion

AClareCorp's EdgeNode Architecture represents the next evolution in federated intelligence—combining modular AI, security, and compliance to redefine distributed computing.

References

NIST SP 800-53 Rev. 5; FISMA 2024; FedRAMP Moderate; FAR 9.104-1; AClareCorp Digital Trust Charter™ 2025.