

Cleo G. Caddle

Principal Technical Program Manager – Mission-Critical & Connected Systems

Austin TX 737.888.1387 cleo.caddle@gmail.com

◆ Hyperscale Architecture & Global Program Governance ◆

Principal systems engineering leader with 10+ years orchestrating **mission-critical programs** at hyperscale. Proven track record delivering **innovative electronic hardware, embedded systems, and distributed edge software**, anchoring 0-to-1 AIoT platforms with real-time data analytics, sensor networks, and hyperscale distributed infrastructure. Expert in validation, yield optimization, and ecosystem convergence for **global engineering environments (Apple, US DoD, ExxonMobil)**. Governs critical-path execution, full-lifecycle PLM, infrastructure readiness, and enterprise risk mitigation while enforcing cross-functional alignment. Maintains absolute **POR accountability**, leveraging **data-driven telemetry and systemic process improvement** as the core methodology of every engagement.

✦ ENTERPRISE PROGRAM & PORTFOLIO GOVERNANCE

Plan of Record (POR)	Infrastructure Readiness
Product Lifecycle Mgmt (PLM)	Critical Path Governance
Phase-Gate Orchestration	CAPEX / OPEX Governance
Cross-Functional Arbitration	Quantitative Risk Modeling
Strategic Portfolio Roadmapping	New Product Introduction (NPI)
Zero-Downtime Deployments	Global PM Mentorship

⚙️ INFRASTRUCTURE & ECOSYSTEM ARCHITECTURE

AI Data Center Infrastructure	Hyperscale AWS Architecture
Global PKI & Trust Infrastructure	HW/SW Ecosystem Convergence
Bare-Metal & Embedded Edge	High-Volume Manufacturing (HVM)
Edge AI & AIoT Platforms	Biometric & RFID Sensor Grids
Real-Time Telemetry Pipelines	OEM/JDM Hardware Architecture
Mission-Critical ITS	Federated IAM & Zero-Trust

📊 EXECUTION METHODOLOGIES & TELEMETRY

Apple Radar & JIRA Enterprise	Dynamic PowerBI & Copilot
Global SSOT Architecture	Enterprise Resource Orchestration
Hybrid Agile & Phase-Gate	CI/CD Deployment Pipelines
Hardware EVT/DVT/PVT Phasing	SOW, BOM & Risk Registers
C-Suite Telemetry & Reporting	Quantitative KPI Architecture
AI-Augmented Workflows	Root Cause Analysis (RCA)

🔗 ENTERPRISE RESILIENCE & YIELD OPTIMIZATION

AI-Driven Automated Remediation	Predictive Threat & Anomaly Detection
Hyperscale Infrastructure Architecture	Strategic Value Engineering (VE)
Hardware Yield & BOM Optimization	First-Pass Yield (FPY) Maximization
Enterprise Ecosystem Integration	Global Product Homologation
NIST / FIPS / ISO Governance	Zero-Downtime BCDR
Automated QA Validation Pipelines	RF / EMC Pre-Compliance

Principal Engineering Leadership & Mission-Critical Systems Governance

Technical Program Manager – Crypto Services & PKI Engineering

2024 – 2025

Apple | Austin, TX

- Orchestrated the **Apple Root Certificate Program**, governing overarching trust policies, WebTrust/ETSI compliance, and the strict onboarding/offboarding of global Certificate Authorities (CAs) to safeguard the OS ecosystem's **cryptographic integrity**.
- Led cross-functional engineering initiatives for foundational trust infrastructure supporting **2.35+ billion devices**, enforcing zero downtime, enterprise-scale validation, and compliance readiness.
- Orchestrated hardware, firmware, and software dependencies across Distributed Compute and Security ecosystems via enterprise **Radar/JIRA governance**, maintaining absolute **Plan of Record (POR) accountability** and strictly enforcing phase-gate milestones.
- Governed C-suite telemetry and quantitative risk modeling by leveraging **Apple Intelligence** and **Apple Enchanté** to auto-generate context-aware visualizations, transforming raw engineering metrics into real-time **executive intelligence**.
- Integrated **AI/ML capabilities** into security operations for automated compliance monitoring, reducing manual overhead by **40%** and architecting zero-friction operational workflows.

Co-Founder & Principal Technical Consultant (AIoT & Systems Integration)

2019 – 2024 | 2026 – Present

IoT LLC (Engineering of Things) | Austin, TX

- Architect **0-to-1 AI data center-ready solutions** incorporating sensor networks, real-time data analytics, and RFID systems, bridging hardware, firmware, and software for **mission-critical infrastructure across AgroTech, Industrial Automation & Robotics, Intelligent Transportation, Manufacturing, Construction, and Professional Motorsports**.
- Direct **hyperscale technical operations** and **protocol-agnostic design** to systematically manage and deliver **4M+ mission-critical edge devices**.
- **Govern spatial computing architecture** as a **Metaverse Standards Forum Principal Member**, orchestrating enterprise interoperability alongside **Google and NVIDIA**.
- **Architect strict hardware resilience** via a proprietary **5-Step Compliance Cycle**, systematically mastering complex **global regulatory frameworks**.
- Orchestrate **vendor relationships, technical integrations, and procurement readiness** across multiple technology stacks; ensure infrastructure readiness for production deployments.
- **Architect and enforce hardware Root-of-Trust (RoT)** frameworks with **automated X.509 PKI management**, eliminating factory provisioning bottlenecks and slashing time-to-market to enable **zero-touch, zero-trust deployments** across **millions of AIoT nodes**.

Engineering Program Manager – IoT & OEM Devices

2017 – 2019

Carnegie Technologies Inc. | Austin, TX

- **Directed end-to-end engineering programs** for the OEM design, validation, and manufacturing of advanced AIoT sensors and gateways from concept through mass production.
- **Orchestrated globally distributed hardware, firmware, software, and Engineering Project Management teams** to architect and deliver highly scalable, full-stack AIoT infrastructures across data-driven, mission-critical domains including Space, Logistics, Transportation, AgroTech, Healthcare, and Manufacturing.
- **Championed secure development initiatives** for high-volume OEM edge devices, deploying rigorous encryption protocols and secure data transmission architectures to safeguard enterprise ecosystems and logistics infrastructure.
- **Overhauled manufacturing security pipelines and testing workflows** by integrating automated validation scripts, significantly increasing production throughput and **reducing overall time-to-market by 30%**.
- **Governed infrastructure readiness and ecosystem deployments**, ensuring seamless interoperability and real-time data connectivity between embedded field devices and centralized data center platforms.
- **Led global product homologation and regulatory compliance** for complex OEM edge devices. Achieved a **100% first-pass yield** across major TIC certifying bodies (TUV, UL, FCC, Intertek) via strict pre-compliance engineering and adherence to RF/EMC safety standards.

Engineering Program Manager – Hyperscale Telecom Core & Billing Architecture

2015 – 2017

Transverse (T-Mobile) | Austin, TX

- **Orchestrated the 0-to-1 architectural transformation** of the Intelligent Billing System for the T-Mobile West Division, establishing a hyperscale distributed compute infrastructure on AWS to drive high-throughput transactions for **tens of millions of subscribers**.
- **Directed a portfolio organization of 12 distributed Project Managers**, driving full-lifecycle execution from infrastructure readiness to zero-downtime cutover while accelerating release velocity.
- **Instituted a dynamic, multi-jurisdictional tax compliance framework** across a massive regional footprint, governing complex regulatory rulesets to eliminate multi-million-dollar audit risk.
- **Engineered real-time continuous audit validation pipelines**, enforcing financial-grade cryptographic security, zero-loss subscriber data integrity, and automated telemetry across distributed billing engines.
- **Governed critical-path integration architecture** between legacy mediation platforms and next-gen billing engines, eliminating systemic revenue leakage and guaranteeing fault-tolerant processing at scale.

Flagship Engineering Programs: Global Trust Infrastructure & Mission-Critical AIoT

- ♦ **Apple Root CA Infrastructure – Global Trust Infrastructure (2.35B+ Devices) | Principal TPM**

Directed **full-lifecycle program execution** for elite PKI and cryptographic operations, overseeing **Apple's foundational Root CA infrastructure** and strict X.509 compliance across an ecosystem of **2.35+ billion devices**. Spearheaded risk mitigation, auditing, and executive reporting while leveraging **Python and Generative AI (Apple Intelligence)** to automate compliance validation, **reducing operational tickets by 40%**.
- ♦ **TxDOT ITS – Critical Transit & Edge Identity Infrastructure (80M+ Annual Boardings) | Lead Program Manager**

Directed the engineering of a **real-time, production POC** for a secure, 3,000-unit Intelligent Transportation System (ITS) for the **Harris Hill County Metro Transit System**, establishing the foundational identity architecture for a massive municipal network scaling to **80+ million annual boardings**. Orchestrated the deployment of **connected transit-technology solutions**, bridging AI, IoT, and PKI with **ruggedized electronic hardware** (multi-protocol contactless readers and high-security MIFARE smart credentials). Enforced strict **zero-downtime governance** and **NIST, FIPS, PCI-DSS, and ISO 9001** compliance across the hardware ecosystem. Engineered **high-throughput validation pipelines** that systematically optimized real-time fleet telemetry for operators and enabled frictionless passenger throughput.
- ♦ **USDOD BISA Ecosystem – Defense & National Security (3M+ Cryptographic Edge Nodes) | Engineering Lead**

Directed the **prototype-to-production engineering lifecycle** for the DoD's flagship Identity Management (IdM) ecosystem, governed by strict NIST, ISO, and military-grade security frameworks. Architected the physical and logical security infrastructure to manufacture, provision, and lifecycle-manage **3 million+ biometric smart tokens**. Orchestrated the procurement, configuration, and secure deployment of **tens of thousands of cryptographic edge nodes (HSMs, smart readers, and issuance devices)**, establishing precision hardware validation and automated manufacturing pipelines **that anchored the bare-metal compute and global data center operations for the DoD**.
- ♦ **ExxonMobil Global IAM Ecosystem – Critical Energy Infrastructure (200K+ Edge Nodes) | Program Manager**

Directed global infrastructure governance for **mission-critical Oil & Gas and Water Exploration operations**, architecting a **zero-downtime federated IAM ecosystem**. Orchestrated the deployment of **300K physical/logical smart tokens** and **200K decentralized edge nodes** (HSMs, CPE, and readers). Championed risk mitigation and BCDR by automating complex workflows and **federated third-party access**, reducing enterprise technical engagement phases by **50%**.
- ♦ **Texas HHSC Medicaid Identity – Statewide Zero-Trust Infrastructure (4.84M+ Hybrid Smart Cards) | Lead Program Manager**

Architected the **0-to-1 statewide rollout** of a **hyperscale, zero-trust identity ecosystem** securing access for Texas Medicaid beneficiaries. Directed physical and logical specifications for **4.84M+ biometric hybrid smart card units**, leading **cross-disciplinary engineering teams** from lab prototype to mass manufacturing as **Principal Systems Integrator**.

Operational Excellence & Core Methodologies

- 📅 **Hybrid Agile & Phase-Gate (PLM)**

Orchestrated hybrid Product Lifecycle Management (PLM), synchronizing asynchronous software CI/CD pipelines with strict Hardware Phase-Gate milestones (EVT/DVT/PVT). Aligned asynchronous engineering tracks to ensure seamless New Product Introduction (NPI) and cross-functional convergence for mass production.
- 🏗️ **AI-Augmented Telemetry & SSOT Governance**

Architected the Single Source of Truth (SSOT) for global portfolio governance utilizing JIRA, Apple Radar, Confluence, and the M365 Enterprise Ecosystem. Augmented governance workflows via Apple Intelligence and leveraged Copilot to engineer dynamic, context-aware PowerBI telemetry that auto-adjusts visualization models based on stakeholder persona, delivering real-time quantitative risk analysis and strict budget oversight.
- 🌐 **Global Supply Chain & OEM/CM Orchestration**

Governed global hardware ecosystems, concurrently orchestrating 15+ tier-one suppliers (OEM/CM/JDM) per flagship program. Directed multi-source procurement and technical integration to eliminate logistical bottlenecks and enforce strict NPI timelines.
- ⚖️ **Engineering Trade-Offs & CAPEX Governance**

Arbitrated cross-functional architecture reviews across hardware, firmware, and distributed systems engineering teams. Optimized multi-million-dollar CAPEX/OPEX budgets through rigorous value engineering, directly balancing physical Bill of Materials (BOM) costs against software delivery schedules to enforce strict performance and compliance standards.

Education & Technical Foundation

Harvard University | Post Graduate Work
Applied Mathematics & Business Administration – Cambridge, MA

Clark University | Bachelor of Science
Mathematics & Computer Science (Minor in Physics) – Worcester, MA

Professional Groups

- ISSA Austin TX Chapter RFID Group
- RSA Conference Group
- Smart Cards Professionals
- Identity Mgmt Specialists
- Global Platform Association
- ISO/IEC 27000 Info Security
- CCADB Group
- Metaverse Standards Forum