



GridCORTEX

SoftServe's AI-Powered Utility Intelligence Framework
· Powered by NVIDIA

Utility Intelligence Framework Guide ·
CLIENT-READY

GridCORTEX

Utility Intelligence Framework

SoftServe's AI-Powered Utility Intelligence Framework · Powered by NVIDIA

10

Solution Domains

187

Validated Utility AI Solutions

22

Operating Domains

For internal use, partner briefings, and client presentations
SoftServe + NVIDIA · June 2026

Executive Summary

GridCORTEX is SoftServe's AI-Powered Utility Intelligence Framework, the intelligence layer above the grid. It sits on top of the systems a utility already owns, answers the questions those systems cannot, and never touches the controls.

Utilities do not have a technology problem. They have an operational adoption problem. The OT stack is excellent at real-time execution and was never engineered for multi-day prediction, cross-domain reasoning, or institutional memory. The questions that fall between the systems (where will the storm break us, which transformer fails next, can we energize the data center by 2027, what did our best operator know) have always been answered with spreadsheets and tribal knowledge. GridCORTEX is the layer where those questions finally get real answers.

WHAT IT IS

- ▶ A framework above, not a system among. Read-only into ADMS, EMS, SCADA, OMS, GIS, AMI.
- ▶ Nine independently deployable solution domains built on a common intelligence framework.
- ▶ Powered by NVIDIA: Earth-2, Isaac ROS 2, Jetson, Omniverse, NeMo, cuOpt, RAPIDS
- ▶ Built and delivered by SoftServe, vendor-neutral above the full OT stack.

WHAT IT IS NOT

- ▶ Not a control system. Zero control pathways, human-in-the-loop always.
- ▶ Not an OT replacement. It makes ADMS, EMS, OMS perform better.
- ▶ Not a black box. Every answer includes reasoning, sources, and confidence.
- ▶ Not a rip-and-replace. Read-only connection, no disruption to OT.

Why Utilities Need a New Intelligence Layer

Five Forcing Functions, All Accelerating Simultaneously. Five industry forces are converging in a way that has never happened before. Utilities that act now will lead. Utilities that wait will spend the next decade catching up. GridCORTEX was designed to address all five simultaneously, and every lead domain maps directly to at least two of them.

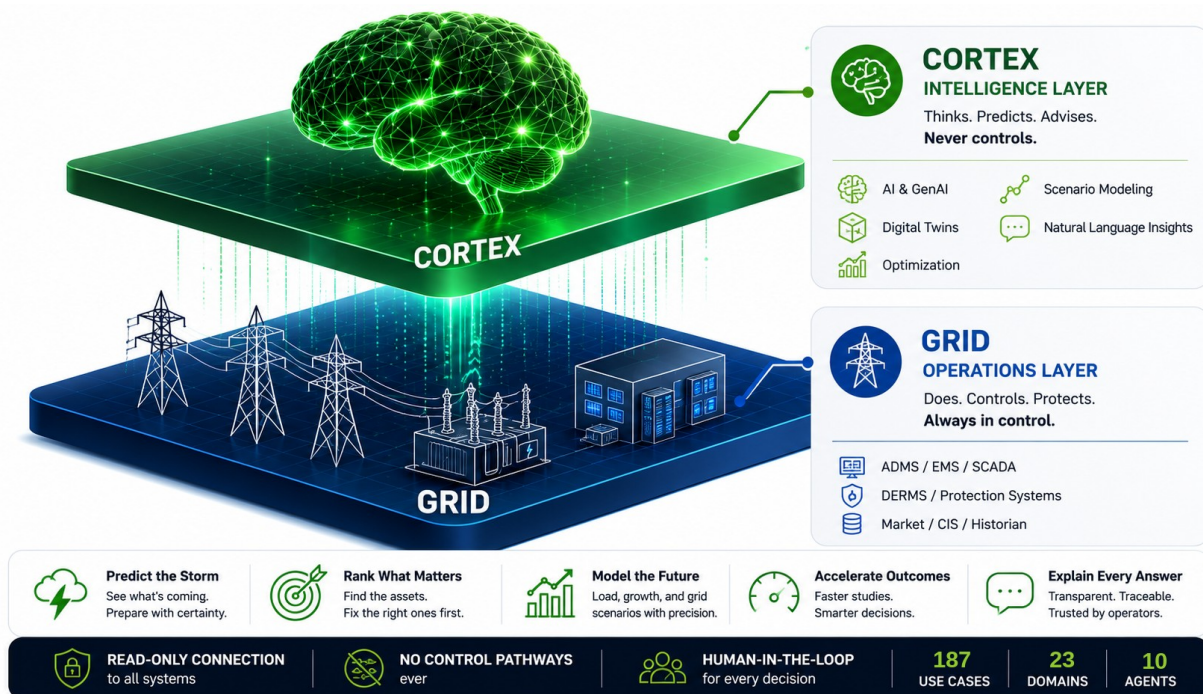
- 01** Data Center Load Wave: The largest load growth since electrification. Utilities that can answer interconnection feasibility in weeks sign the gigawatts.
- 02** Aging Workforce & Infrastructure: Half the experienced operators retire this decade — forty years of operating knowledge walks out every Friday — and aging infrastructure raises failure risk and maintenance cost at the same time.
- 03** Extreme Weather Mandates: Storm, wildfire and flood risk compound every year. Regulators want demonstrated, auditable preparedness, not asserted plans.
- 04** Grid Edge & DER Transformation: Electrification and DER are invalidating legacy planning assumptions. Utilities need real-time visibility and optimization at the grid edge — DER integration, hosting capacity, EV siting, and VPP orchestration.
- 05** Regulatory Pressure & Capital Scrutiny: Reliability, compliance and rate-case scrutiny are rising together. Utilities must demonstrate performance, justify capital, and manage risk with auditable, data-backed evidence.

The Gap Layer Concept

The utility OT stack is excellent at what it was engineered for. ADMS, EMS, SCADA, OMS. None of them was engineered for multi-day physics-informed prediction, cross-domain data fusion, natural-language reasoning over decades of records, or autonomous physical inspection. GridCORTEX lives in the gap layer above OT, connecting read-only to every system of record, fusing their data into one intelligence fabric, and returning recommendations for human review and execution. Control authority never moves.

Three rules, enforced in architecture not messaging:

- ▶ Augment, never replace. GridCORTEX recommends, simulates, predicts, and explains. ADMS, EMS, and SCADA execute.
- ▶ Discovery first. Every engagement begins by mapping what the utility already owns. GridCORTEX is scoped to the gaps, never the overlaps.
- ▶ Explainability as a feature of record. Every recommendation carries its reasoning, data sources, and confidence. If it cannot explain itself, it does not ship.



GridCORTEx is the cortex above the grid: it thinks, predicts, and advises — and never touches the controls.

The Ten Solution Domains

Each domain deploys independently above existing OT infrastructure. GridCORTEx leads with the four domains where utility executives have active budgets and funded business cases today: Connect, Resilience, Asset, and Operations. Edge, Customer, and Enterprise expand the framework as value is demonstrated. Robotics is positioned as a future-ready capability — utilities today are buying reliability, resilience, and asset intelligence, not standalone robotics initiatives. Robotics enters accounts through those lead domains, supporting Asset with autonomous inspection, Resilience with damage reconnaissance, and Operations with field awareness. Nuclear is a specialized domain for utilities with operating nuclear plants, SMR development programs, or nuclear-data center co-location transactions — it deploys entirely in the non-safety-related space, requiring no NRC software qualification. ISO/RTO Markets extends the framework to a second buyer: the seven U.S. system operators themselves — queue study acceleration, market rules intelligence, resource adequacy stress-testing, and market surveillance — built on the same read-only, human-in-the-loop architecture. Every domain added builds on the same common intelligence foundation, making the next one faster and cheaper to activate.

	DOMAIN	PRIMARY BUYER	WHAT IT DELIVERS
	Operations	VP Grid Operations / COO	ADMS co-pilot, alarm triage, switching validation, storm pre-positioning, field AR/XR
	Resilience	Chief Wildfire / Resilience Officer	Storm prediction, wildfire ignition detection, PSPS minimization, flood and freeze digital twins
	Asset	VP Asset Management	Transformer DGA, predictive asset twins, cable failure prediction, critical spares strategy
	Edge	VP Distribution Planning / DER	DER interconnection, hosting capacity, VPP orchestration, EV siting, AML intelligence

	DOMAIN	PRIMARY BUYER	WHAT IT DELIVERS
	Customer	Chief Customer Officer	Grid-aware chatbot, billing exceptions, non-technical loss detection, rate design simulation
	Connect	SVP Strategy / Transmission	Data center interconnection, co-location feasibility, flexible load, tariff structuring
	Enterprise	CISO / VP Regulatory / CFO / VP Markets	NERC CIP automation, OT cybersecurity, regulatory filing, board intelligence
	Robotics	VP T&D Operations / Chief Safety	Autonomous drone inspection, substation robot, underground crawler, downed conductor recon
 Nuclear		Chief Nuclear Officer / CFO	Life extension economics, RPV analytics, outage optimization, nuclear-data center co-location PPA, SMR siting feasibility, NRC regulatory intelligence
 ISO/RTO Markets		ISO/RTO COO / VP Market Ops / VP Planning	Queue study acceleration, tariff copilot, resource adequacy twins, congestion forecasting, market surveillance, DER onboarding, blackstart drill simulation

Domain Detail



GridCORTEX Operations

Control Room & Field Force Intelligence

The control room and field force domain. Covers ADMS co-pilot, alarm flood triage, switching validation, restoration sequencing, load shed orchestration, shift handoff intelligence, transmission operations, field force dispatch optimization, damage assessment, AR/XR field copilot, and operator simulation training. Answers the question every operator has had for decades: what is actually happening on my grid right now, what caused it, and what should I do first?



GridCORTEX Resilience

Storm, Wildfire & Climate Defense

The extreme-event domain. Storm prediction and pre-positioning, wildfire ignition risk scoring and PSPS scope minimization, real-time edge AI ignition detection on pole-top and tower cameras, flood and freeze digital twins, hardening portfolio optimization, and the full vegetation management stack. The replay pilot (running AI models against archived storm data to prove outage reduction) is the fastest and most compelling proof mechanism in the portfolio.



GridCORTEX Asset

Fleet Health & Capital Economics

Predictive asset twins, transformer acoustic and thermal digital twin, DGA interpretation, cable failure prediction, end-of-life economics, critical spares strategy, and generation fleet predictive maintenance. Supply chain disruption and aging fleet exposure have made asset intelligence a board-level conversation. The economics argument is straightforward: defer one transformer replacement per year and the program pays for itself.



GridCORTEX Edge

Planning, DER & Grid Edge

Electrification load growth modeling, non-wires alternatives, network model health, VVO performance audit, DER interconnection queue optimization, hosting capacity analysis, VPP orchestration, EV siting, FERC 2222 readiness, flexible interconnection for large loads, AML interval intelligence, and edge AI fault anticipation at distribution automation nodes.



GridCORTEX Customer

Customer & Revenue Intelligence

Grid-aware customer chatbot, agent copilot for service representatives, billing exception resolution, non-technical loss and revenue protection analytics, rate design simulation, and vulnerable customer proactive outreach. GenAI grounded in the utility's own rate schedules, tariff filings, and account records.



GridCORTEX Connect

Large Load & Interconnection

The mission-critical large load domain. Data center interconnection modeling and feasibility analysis, co-location assessment, flexible load orchestration, tariff and contract structuring, large load resilience digital twins. Speed-to-answer is the primary competitive differentiator: utilities that answer feasibility in weeks sign the gigawatts; those that cannot lose the investment.



GridCORTEX Enterprise

Compliance, Security & Board Intelligence

NERC CIP evidence automation, OT network monitoring and incident response, regulatory filing and discovery response factories, docket intelligence, markets analytics, safety analytics, supply chain intelligence, executive and board intelligence briefings, and M&A diligence support.



GridCORTEX Robotics

Autonomous Inspection & Physical AI

Physical AI and autonomous inspection, available when the utility is ready. Robotics enhances core domain value: autonomous drone inspection supports Asset health monitoring, damage reconnaissance supports Resilience, and ground-level field awareness supports Operations. Use cases include transmission line drone inspection, substation autonomous inspection robot, underground cable and vault crawler, and storm damage assessment. GridCORTEX activates Robotics after core domains are established and utility readiness is confirmed.



GridCORTEX Nuclear

Nuclear Operations & Fleet Intelligence

Purpose-built for utilities with operating nuclear plants, SMR development programs, or nuclear-data center co-location transactions. Deploys entirely in the non-safety-related domain — read-only, advisory-only, human-in-the-loop — requiring no NRC 10 CFR Part 50 Appendix B software qualification. 17 use cases spanning life extension economics, primary component condition analytics, outage optimization, regulatory intelligence, data center co-location PPA structuring, SMR siting feasibility, and advanced reactor digital twins.



GridCORTEX ISO/RTO Markets

Market & System Operator Intelligence

The system operator domain — GridCORTEX applied to the seven U.S. ISOs/RTOs as buyers. Interconnection queue study acceleration under FERC Order 2023, market rules and tariff copilot, resource adequacy and extreme weather scenario twins, operator-side congestion forecasting, market surveillance and anomaly detection, Order 2222 DER aggregation operations, and joint blackstart restoration drill simulation. Same architecture, second institution: read-only above the market stack, explainable, human-in-the-loop always. See the ISO/RTO Market Context Matrix (Doc 11) for per-market positioning.

Solution Architecture

GridCORTEX uses a Layer 0 plus four-layer model. Layer 0 is the utility's systems-of-record boundary — ADMS, EMS, SCADA, OMS, GIS, AMI — which GridCORTEX connects to read-only and never modifies. Layers 1 through 4 are the GridCORTEX intelligence framework. None of these layers touch the control systems below.

Layer 0: Systems of Record

ADMS, EMS, SCADA, OMS, DERMS, GIS, EAM, AMI, CIS, ERP, and market systems remain authoritative. GridCORTEX consumes from them through read-only gateways. Nothing writes to a control system.

Layer 1: Data and Integration Fabric

Streaming ingestion (PMU, AMI interval data, alarms, events), batch and document ingestion (records, filings, work orders), imagery and LiDAR pipelines from sensors and autonomous platforms, historian and PI reads, GIS and asset data, EAM and WMS feeds, and weather and market data, organized around a semantic grid model. SCADA, OMS, and other OT control systems remain authoritative in Layer 0 and are connected read-only at the ingest boundary; their data streams flow into the fabric but the systems themselves do not become part of it.

Layer 2: Intelligence Engines (NVIDIA Accelerated)

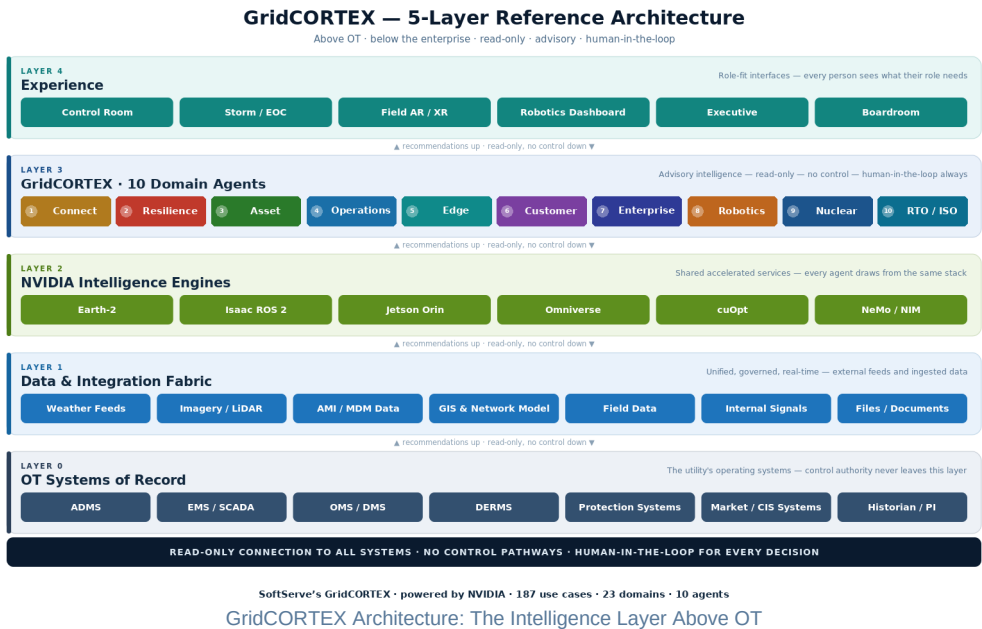
Earth-2 for weather simulation. Isaac ROS 2 for autonomous robotics. Jetson Orin for edge AI. PhysicsNeMo for grid physics. cuOpt for optimization. RAPIDS for analytics. Metropolis for vision AI. NeMo and NIM for generative AI grounded in utility records. Morpheus for cybersecurity.

Layer 3: Domain Agents and Orchestration

Ten solution domains plus the agent runtime: orchestration, guardrails, role-based authority, explainability enforcement, confidence scoring, and human-in-the-loop checkpoints.

Layer 4: Experience

Role-fit surfaces: control room console, storm and EOC command views, field mobile with AR/XR overlay, robotics mission planning, executive briefing, customer channels, and APIs for existing utility tools.



GridCORTEX Architecture: The Intelligence Layer Above OT

NVIDIA Technology Stack

GridCORTEX is built on NVIDIA accelerated computing from the ground up. Every domain maps to one or more NVIDIA technology capabilities.

NVIDIA TECHNOLOGY	WHAT IT DOES	GRIDCORTEX DOMAINS
Earth-2	Kilometer-scale weather and climate simulation	Resilience, Connect, Operations
Isaac ROS 2	Autonomous robotics navigation and mission orchestration	Robotics
Jetson Orin	On-device edge AI inference for robotics and field nodes	Robotics, Edge, Resilience
Omniverse	Digital twin visualization and robotics mission environment	Asset, Robotics
NeMo / NIM	Generative AI and RAG grounded in utility records	All 10 domains
cuOpt	Fleet, portfolio, and schedule optimization at scale	Operations, Resilience, Robotics
RAPIDS / cuML	Population-scale analytics and machine learning pipelines	Edge, Asset, Customer, Enterprise
Metropolis / TAO	Vision AI for imagery, inspection, and vegetation management	Resilience, Robotics
Morpheus	Cybersecurity event detection and OT network monitoring	Enterprise

Why SoftServe

Five Chairs. One Perspective.

Most grid modernization solutions are built from a single viewpoint: software vendor, consultant, or systems integrator. GridCORTEX was built from all five. That is why every solution starts with operations, not technology.

01 The Operator

We have lived inside the utility control center. Reliability, outage restoration, storm response, switching operations, NERC compliance, and the realities of operating a power grid when the lights are on the line.

Captured: Operator-grade credibility and real-world operational perspective.

02 The Technology Provider

We have built, deployed, and supported the industry's most advanced grid operations technologies across North America and internationally.

Captured: Deep understanding of utility OT from the inside.

03 The Systems Integrator

We have led utility modernization programs across multiple vendors, platforms, and technologies: integration, governance, organizational change, and enterprise transformation at scale.

Captured: The ability to connect complex technology ecosystems.

04 The Consulting Partner

We have advised utility executives on strategy, business cases, operating models, and long-term modernization planning from the executive table.

Captured: Executive-level transformation and strategic growth perspective.

05 The AI Solutions Leader

Today we apply that collective experience to the next generation of utility intelligence. GridCORTEX combines operational expertise, utility domain knowledge, NVIDIA accelerated computing, and purpose-built AI into a framework that starts with operations, not technology.

Captured: The ability to transform decades of utility knowledge into practical, operational AI.

Why GridCORTEX Is Different

- ▶ Most AI solutions start with technology and search for a problem.
- ▶ GridCORTEX starts with utility operations.
- ▶ Built by people who have operated the grid, deployed grid technology, integrated enterprise systems, and advised utility leadership.

That is the perspective no pure AI company can replicate.

How We Engage

Consulting-Led. Engineering-Delivered. Outcome-Proven.

SoftServe delivers GridCORTEX through structured consulting and engineering engagements, not software licensing. Engagements begin with the four domains where utility budgets are active today: Connect, Resilience, Asset, and Operations. Every engagement is scoped to a specific problem, a named KPI, and a defensible proof of value before scale.

01 Discovery & Solution Design 2–6 Weeks Assess your environment against the GridCORTEX solution library. Map gaps. Design a scoped engagement with agreed success criteria before any engineering begins.	02 Proof of Value Pilot 3–6 Months One solution. One KPI agreed in writing. Where history allows, replay the proof against events the utility has already lived through.	03 Production & Expansion Ongoing Managed Services Full deployment with SoftServe engineering and managed services. Each domain activates faster because the data integration is already done.
---	---	---

The compound integration advantage: every additional solution domain deployed costs materially less to integrate than the first. SoftServe passes a portion of that cost reduction through to reward expansion.

GridCORTEX · SoftServe's AI-Powered Utility Intelligence Framework · Powered by NVIDIA
INTERNAL · SoftServe + NVIDIA · Confidential · June 2026

The Agent Runtime: Always-On, Provably Governed

Beneath the ten agents sits the NVIDIA Agent Toolkit with NemoClaw — open blueprints for always-on, domain-specialized agents. OpenShell runs each agent sandboxed under signed policies (what it may see, do, and where inference runs), NeMo Relay captures every decision as replayable audit evidence, and Nemotron open models support fully on-premises deployment for CIP-constrained and nuclear environments. The practical meaning for a utility: GridCORTEX's read-only, human-in-the-loop posture is enforced by the runtime itself — and every recommendation an agent ever makes carries its own audit trail.