Celona 5G LAN

Enterprise private 5G, converged with Wi-Fi under the Celona Orion platform.

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/ THE PROBLEM

The floor changed, wireless didn't

Enterprise wireless was built for people: a person with a device, moving through a building on business hours. A new class of worker has arrived. Robots, autonomous vehicles, vision systems, and software agents now work the floor around the clock, and they judge a network by a different standard - not average throughput, but whether the packet arrives on time, every time.

Best-effort wireless was never built for that. Coverage engineered for carpeted space thins out across metal, motion, and open yards. Quality of service is coarse and network-wide, so intent is lost the moment traffic crosses the wireless boundary. Sessions drop at the speeds industrial vehicles actually travel. And where enterprises add private cellular to close the gap, it usually arrives as a second network - its own identity, its own tools, its own team - with the cost of that separation growing with every device that moves between radios.

The opportunity isn't to replace the wireless already in place but to complete it: **private 5G that augments the network you already run, converged with Wi-Fi under one identity, one policy engine, and one lifecycle**.

Best-effort wireless on the industrial floor - the challenges

- Best-effort wireless can't guarantee the latency and loss that machine workloads demand.
- Coverage designed for people breaks down across metal, motion, and open yards.
- Sessions drop at industrial speeds, stranding AGVs and AMRs mid-task.
- Each radio is an island: separate identity, management, and policy per network.
- Private cellular usually arrives as a second network, with a second team to run it.

/ DESIGN PRINCIPLES

Key considerations for wireless that carries machines

01

Guarantees for machine workloads, not averages

A new class of worker - robots, AGVs, vision systems, software agents - works the floor around the clock and doesn't tolerate a dropped packet. The wireless carrying these workloads must deliver guarantees, not averages: per-device, per-application service levels for priority, latency, and loss, enforced where traffic enters the network and carried onto the wire. Coverage, too, must be engineered for the industrial floor - metal, motion, interference - not the office.

02

One wireless fabric, not another island

Private cellular earns its place only if it joins the wireless the enterprise already runs. That means one fabric across private 5G and Wi-Fi: one identity for every device on every radio, one policy engine across RAN and LAN, one management plane watching both. Anything less arrives as an island - separate credentials, separate tools, separate teams - and the cost of that island grows with every device that moves between radios.

03

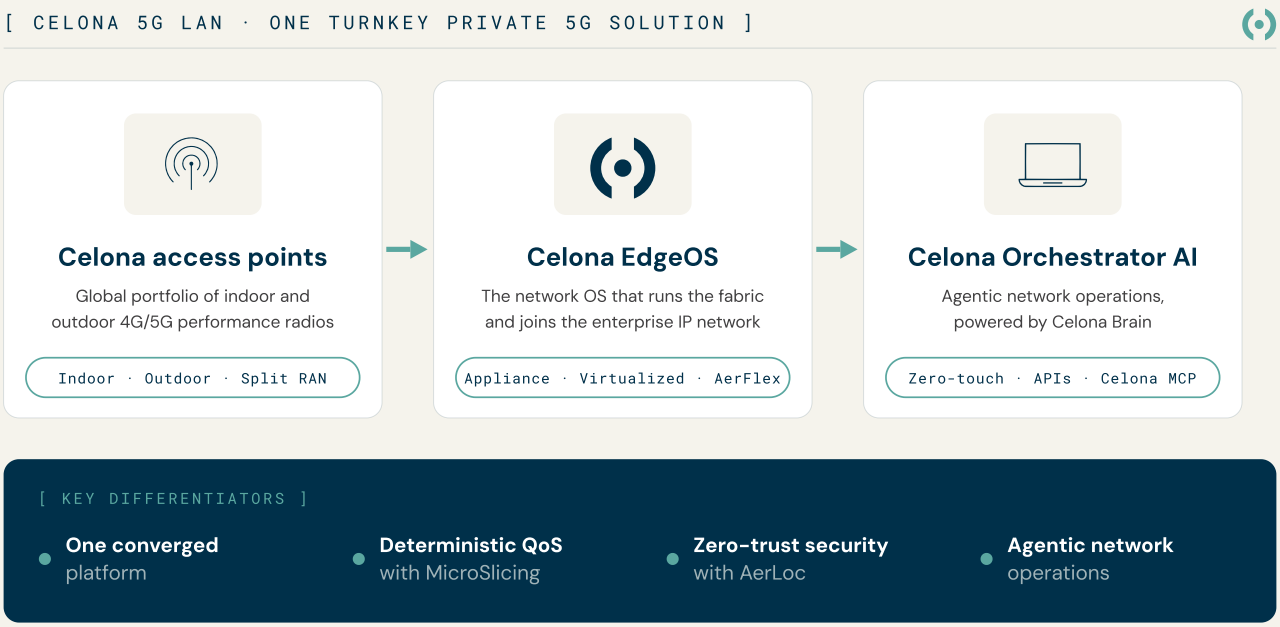
Run by the team you have, on the network you have

The enterprise already has a network, a security stack, and a team. Private wireless must plug into all three: inherit VLANs, IP domains, and network policies; separate IT and OT traffic while integrating with the firewalls, NAC, and AAA systems already in place; and deploy and operate without a carrier's operating model - one software stack, one subscription, one lifecycle an IT team can own.

/ THE SOLUTION

Introducing Celona 5G LAN

Celona 5G LAN is enterprise private 5G delivered as part of Celona Orion, the agentic converged wireless platform. It brings licensed and shared-spectrum 4G/5G to the industrial floor – deterministic, secure, and engineered for machines – and converges it with Wi-Fi under one identity, one policy engine, and one management plane. Access points, EdgeOS, and Orchestrator AI are tightly integrated and delivered as one subscription, with Wi-Fi included at no added cost.



Celona 5G LAN - one turnkey solution: Celona access points, Celona EdgeOS deployed as an appliance, virtualized, or with AerFlex, and Celona Orchestrator AI powered by Celona Brain.

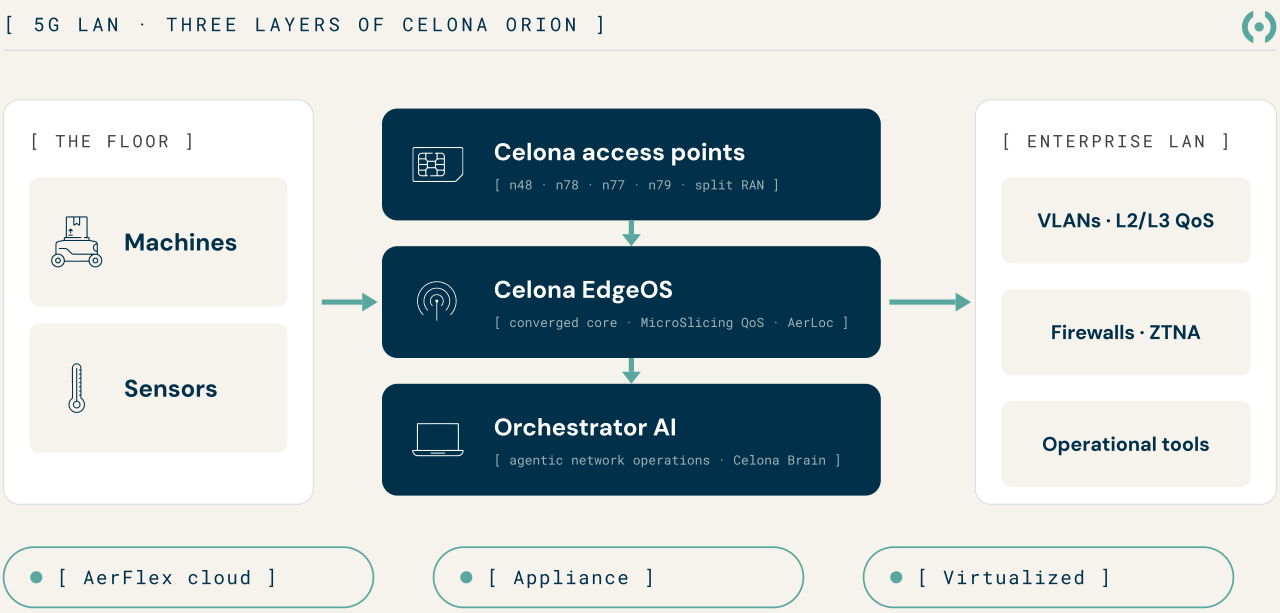
One platform, one supply chain

5G LAN inherits the trust model of the platform it belongs to. Celona writes the full software stack in-house – the 4G/5G core, both wireless access layers, the SIM, routing, and security engineered together – and builds the access points that carry them. That means one supply chain, one security model, and one accountable vendor for the fabric carrying your most operationally critical traffic, managed end to end by Celona Orchestrator AI.

/ ARCHITECTURE

How 5G LAN delivers deterministic wireless

5G LAN is delivered by three layers of Celona Orion – the access layer, the network operating system, and agentic network operations – so machine workloads get deterministic wireless that behaves like part of the enterprise network.



5G LAN: Celona access points deliver industrial coverage; EdgeOS runs the converged core with MicroSlicing QoS and AerLoc IT/OT separation into the enterprise LAN; Orchestrator AI, powered by Celona Brain, runs the lifecycle.

Access: a global portfolio of 4G/5G radios

Indoor and outdoor Celona access points bring plug-and-play private 4G/5G connectivity across global spectrum - n48 (CBRS), n78, n77, and n79 - with integrated APs for most sites and split RAN where scale demands it. Split RAN also opens the door to bespoke regional bands, partnering with the appropriate RU vendor for that market. Intelligent spectrum management plans, monitors, and re-optimizes continuously across shared, unlicensed, and privately licensed bands. The result is coverage engineered for the industrial floor, with a fraction of the radios Wi-Fi needs.

Network OS: EdgeOS runs the converged fabric

Celona EdgeOS terminates the RAN in a built-in 4G/5G core and integrates the wireless fabric into the enterprise IP network - inheriting VLANs, IP domains, and network policies instead of hiding devices behind a carrier-style NAT. MicroSlicing enforces per-device, per-application QoS across RAN and LAN alike. AerLoc applies SIM-based zero-trust identity, air-gaps IT and OT traffic on the same fabric, and plugs into the firewalls, NAC, and AAA systems already in place. EdgeOS deploys as a hardware appliance, virtualized, or cloud-delivered with AerFlex.

Agentic network operations with Orchestrator AI

Celona Orchestrator AI is the agentic network operations plane for the fabric: private 5G, Wi-Fi, and Starlink managed from one console, with zero-touch onboarding, templates, APIs, and SIM lifecycle management. Underneath it, Celona Brain reasons over live telemetry, logs, and diagnostics using a mixture-of-experts architecture grounded in Celona's own engineering, pairing your enterprise LLM for intent with Celona Brain for network analysis. Engineers work in natural language, with Celona AI Skills and Agents alongside them.

Because all three layers ship as one platform under Celona Orion - with Wi-Fi included in the same subscription - private 5G arrives not as a parallel network but as added capability on the network the enterprise already runs, owned by the team that already runs it.

Benefits

01 **Deterministic performance** — per-device, per-application QoS with MicroSlicing, enforced across RAN and LAN alike.

02 **Coverage built for the floor** — industrial-grade coverage indoors and out, with a fraction of the radios Wi-Fi needs.

03 **Mobility that doesn't drop** — seamless handovers at industrial speeds, so AGVs and AMRs stay connected on the move.

04 **One fabric, one identity** — private 5G and Wi-Fi under one policy engine and one SIM identity, with IT and OT air-gapped.

05 **No second network to run** — one software stack, one subscription, agentic network operations your team can own.

/ CAPABILITIES

Additional 5G LAN capabilities

Because Celona builds the radios, the core, the SIM, and the software that runs them, capabilities that elsewhere require integration projects are properties of the fabric itself.

Deterministic QoS with MicroSlicing

Traffic is segmented instantly by device, application, or flow, with QoS policies applied without manual configuration and SLAs enforced across RAN and LAN. Segments map to VLANs, firewall zones, or user groups on the enterprise network.

Zero-trust security with AerLoc

SIM-based identity gives every device secure, agentless authentication with no endpoint software, dynamic per-device policy enforcement, and an IT/OT air-gap on one fabric - integrated with existing firewalls, NAC, and SD-WAN.

Global spectrum, intelligently managed

Closed-loop planning and self-optimization across n48 (CBRS), n78, n77, and n79, with SAS integration where shared spectrum requires it. Split RAN adds bespoke regional bands through the right RU vendor partner - no manual RF tuning site by site.

Seamless device experience across radios

One SIM or eSIM authenticates on both private 5G and Wi-Fi, and the network steers devices between radios for capacity and reliability - holding sessions through handovers at industrial vehicle speeds.

Neutral Host with Celona MoXN

The same infrastructure extends public carrier coverage indoors through Celona MoXN, the cloud-based multi-operator exchange, with automated onboarding and activation - no separate DAS build required.

Expert reasoning with Celona Brain

Celona Brain grounds operations in live telemetry rather than static training data, using a mixture-of-experts architecture built on Celona's engineering knowledge. It is included with Celona Orion; customers connect their own enterprise LLM credentials.

Flexible deployment for every site

EdgeOS runs as a hardware appliance for dense campuses, virtualized on existing server estates, or cloud-delivered with AerFlex for AP-only sites - one software platform and one operating model everywhere.

Open device ecosystem

A growing certified ecosystem - Apple handsets, mobile routers from Digi and Siemens, ruggedized handhelds from Zebra, Pepperl+Fuchs, and Honeywell, and many more - with performance certified per use case and bulk eSIM provisioning via MDM.

/ COMPARE

How 5G LAN compares

The real question isn't whether machine workloads need private 5G – it's whether it arrives as one more network to run. With 5G LAN, it doesn't.

	LEGACY BEST-EFFORT WIRELESS	5G LAN - PRIVATE 5G IN THE CONVERGED FABRIC
PERFORMANCE	Best-effort delivery with coarse, network-wide QoS; intent is lost at the wireless boundary.	Per-device, per-application QoS with MicroSlicing, enforced across RAN and LAN alike.
COVERAGE	Designed for carpeted space; density added AP by AP to cover metal, motion, and open yards.	Radios engineered for industrial sites, indoors and out, with a fraction of the APs.
CONVERGENCE	Private cellular arrives as a second network with its own identity, tools, and policy.	One fabric with Wi-Fi under one identity, one policy engine, one management plane.
INTEGRATION	A parallel network behind carrier-style NAT; IT/OT separation means duplicate infrastructure.	Inherits VLANs and IP domains; AerLoc air-gaps IT and OT across firewalls, NAC, and AAA.
OPERATIONS	Manual, portal-driven work by wireless specialists, site by site.	Agentic network operations - AI skills and agents reasoning on live network context.

/ USE CASES

Technology use cases

5G LAN carries the workloads that best-effort wireless can't - wherever machines, vehicles, and the people working beside them depend on the network holding.

Manufacturing — AMRs, vision systems, and time-sensitive control traffic across dense plants.

Warehousing and logistics — AGVs, scanners, and automation across high-bay sites and outdoor yards.

Oil, gas, and petrochemical — wide-area outdoor coverage with hazardous-area compliance.

The connected worker — one identity and one secure experience as people move across a site.

Remote and temporary sites — AerFlex with Starlink backhaul where fixed infrastructure doesn't exist.

/ THE PAYOFF

Private 5G without a second network

5G LAN marks a shift in how private cellular reaches the enterprise: not as a parallel network with its own identity, tools, and team, but as deterministic capability added to the wireless fabric already in place. Celona access points deliver industrial coverage with a fraction of the radios; EdgeOS runs private 5G and Wi-Fi as one converged fabric, holding machine traffic to per-device service levels and air-gapping IT from OT while inheriting the enterprise's own VLANs, firewalls, and policies; and Orchestrator AI, powered by Celona Brain, gives a lean team agentic network operations over both radios. One platform, one subscription, one lifecycle.

The real question isn't whether machine workloads need private 5G - it's whether it arrives as one more network to run. With 5G LAN, it doesn't - it arrives as part of the network you already have.

/ REFERENCES

01 Celona MicroSlicing configuration

02 AerFlex configuration

03 Celona eSIM lifecycle management

04 Network access control (NAC) integration - Cisco ISE

05 Celona 5G LAN certified devices

/ ABOUT CELONA

Celona is the company behind Celona Orion, the industry's first Agentic Converged Wireless Platform. Enterprises in manufacturing, logistics, mining, energy, and healthcare use Celona to connect the machines, sensors, autonomous systems, and people running their physical operations - with the deterministic performance, security, and enterprise control that off-the-shelf wireless can't deliver. For more information visit celona.io.

celona

hello@celona.io

900 E Hamilton Ave Suite 200, Campbell, CA 95008, United States