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Unplugged: Europe's Sovereign Cloud Ambition Needs a Hardware Ally

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Europe's quest for cloud sovereignty remains as persistent as ever. From Gaia-X to IPCEI-CIS, and now EuroStack, Brussels has consistently aimed to regain control over its data, digital infrastructure, and technology standards. The rationale is straightforward: as digital platforms evolve into the arteries of economic life, reliance on a few foreign cloud providers creates mounting strategic, legal, and industrial vulnerabilities.

Yet, despite substantial political will and heavy investment, Europe's "sovereign cloud" vision remains fragmented and unresolved. It is not a single goal but a convergence of political, economic, and industrial challenges, from exposure to extraterritorial legal regimes and market concentration to the protection of domestic industries.

For Europe, cloud sovereignty isn't just a cybersecurity concern. It's fundamentally a matter of long-term competitiveness.

The global cloud market operates on winner-takes-all dynamics: once a provider achieves scale, network effects, switching costs, and economies of scale quickly reinforce its dominance. This concentration has raised alarms across Europe, where reliance on non-European providers has eroded data access, regulatory control, and technological self-reliance.

But digital-age sovereignty cannot rely solely on data localization or regulatory compliance. True autonomy hinges on controlling the cloud's physical backbone—the

servers, storage, and network infrastructure underpinning Europe's digital infrastructure.

While policy attention has centered on governance and standards, the hardware dimension remains underdeveloped. Every layer of the cloud stack carries geopolitical dependencies, and much of Europe's physical base still originates from Asian suppliers, leaving the region exposed to legal and supply-chain risks.

To achieve genuine sovereignty, Europe must look beyond the virtual layer and recognize a harder truth: digital sovereignty starts with hardware. Expanding this view also creates an opening for strategic cooperation with Taiwan, allowing both sides to move beyond a buyer-supplier dynamic and jointly strengthen the resilience of global cloud infrastructure.

Beyond Regulatory Sovereignty

Europe has long acknowledged the strategic significance of its digital infrastructure, yet its sovereign cloud initiatives have not matured into a comprehensive hardware strategy. The EU's Cybersecurity Certification Scheme for Cloud Services (EUCS) and national data-sovereignty clauses represent meaningful progress, strengthening Europe's control over how data is processed, stored, and transferred.

However, this progress exposes a critical blind spot. Regulatory sovereignty—achieved through certifications, compliance, and interoperability—does not automatically result in operational sovereignty. The resilience and independence of Europe's digital infrastructure rely not only on who governs the data, but also on who constructs and maintains the supporting systems.

Every layer of the cloud stack—from semiconductors and circuit boards to server racks and cooling systems—is part of an intricate, globally integrated global supply chain. And much of that chain runs through Asia. Even when cloud data centers are located in Frankfurt or Paris, their physical backbones—servers, power modules, and printed circuit boards—often originate in Taiwan.

Europe's ongoing discourse risks becoming confined to a "software-first" perspective. While policies can regulate data, they cannot fabricate microprocessors. Without secure and diversified access to hardware, Europe's digital sovereignty will remain theoretical. Impressive in principle, but exposed in practice.

The Hardware Supply Chain Behind the Cloud

Cloud services may appear virtual, but they rely on tangible foundations. Servers form the backbone of data centers, built through a highly specialized supply chain that spans semiconductors, modules, and integration.

The shift from traditional CPU-based servers to GPU-powered AI servers—capable of cluster computing—has intensified hardware demand and reshaped global production. Taiwan now produces over 80% of global servers and nearly 90% of AI servers, supported by a complete, vertically integrated ecosystem.

To understand Taiwan's dominance, it is essential to examine the server supply chain's three tiers, which bring together upstream semiconductor components, midstream assembly, and downstream system integration (see Table 1).

Table 1. Taiwan's Three-Tier Server Ecosystem

Stage	Key Focus & Components	Taiwan's Strengths & Leading Firms
Upstream (Components & Core Chips)	• CPUs & GPUs – computing engines (U.S.-dominated) • BMCs – system management • ABF substrates – chip-to-board connection • PMICs – power efficiency control	• Near-monopoly in BMCs (Baseboard Management Controllers – system management components) (ASPEED, Nuvoton); • Global leadership in ABF substrates (materials enabling chip-to-board connections) (Unimicron, Nan Ya PCB); • Strong PMIC (Power Management Integrated Circuits) ecosystem: (Richtek, uPI); → Provides irreplaceable complementary technologies enabling U.S. chips to operate efficientlycomplementary technologies enabling U.S. chips to operate efficiently
Midstream (Modules & System Parts)	• Printed circuit boards (PCBs) • Power supply units (PSUs) • Cooling systems (fans, vapor chambers, liquid cooling) • Mechanical design (chassis, racks) • Connectors & sockets	• Complete, diversified ecosystem covering PCBs, PSUs, and cooling • Leading firms: Delta, Auras, Chaun-Choung, Taisol; → Rapid innovation capacity to meet hyperscalers' AI server needs
Downstream (Assembly & Delivery)	• System integration & final shipment • Transition from brand-OEM to ODM-Direct procurement	• ODM-Direct global leader: 36.5% of market in 2024 (ahead of Dell 15.9%, HPE 12.7%)[1] • Dominant assemblers: Quanta, Wistron, Foxconn, Inventec; • Spin-offs: Wiwynn, Quanta Cloud Technology serve Amazon, Microsoft, Google, Meta. → Over 80% of global servers assembled by Taiwanese firms.

Source: MIC, 2025.

From Manufacturing Hub to Strategic

With AI computing demand surging and supply chain resilience now a geopolitical priority, Taiwan's server production is expanding beyond Asia, as leading manufacturers seek closer access to key markets and reduced risks.

This ecosystem is reaching Europe, where Foxconn has supplied advanced AI servers and liquid-cooling solutions from its European plants for over three years.[2] Inventec expanded its Brno facility in late 2024 to boost high-performance server output.[3] Quanta began operations at a new German site in the same year.[4] Policy incentives and customer proximity are bringing Europe and Taiwan's supply-chain interests together.

For Europe, partnering with Taiwan offers more than supply security. As influence shifts from brand vendors to direct manufacturers, it embeds sovereignty in the hardware itself."

In the cloud era, sovereignty has layers: regulations set the rules, services offer functionality, but hardware underpins capability. Without reliable access to critical components, even the best frameworks cannot guarantee autonomy. Hardware partnerships are essential for true digital sovereignty.

Expanding Europe's Sovereign Cloud with Taiwan

As Brussels prepares to unveil the Cloud and AI Development Act, the debate over what truly defines a sovereign cloud has reached a critical juncture. Legal frameworks and regulatory controls are essential, but rules alone cannot deliver sovereignty. It also requires resilient supply chains, diversified partnerships, and guaranteed access to both infrastructure and services.

In this regard, Taiwan offers more than hardware. With decades of experience cultivating a resilient ICT ecosystem under geopolitical pressure, it can serve as a trusted partner for Europe. Europe's International Digital Strategy promotes partnerships with Singapore, Japan, and South Korea, each offering unique digital strengths. Taiwan surpasses these by bringing manufacturing expertise and resilience. By engaging Taiwan not only as a supplier but as a strategic collaborator, Europe can reinforce its sovereignty with real resilience. Policymakers should avoid isolation and instead design digital sovereignty around openness and trusted cooperation.

Notes and References

1 Market Intelligence & Consulting Institute (2025)。2025-2026 年資通訊產業展望。Available at: https://mic.iii.org.tw/AISP/ChartS?docid=PPT1140905-1 (Accessed: 26 September 2025)。

2 方韋傑（2022）。鴻海增資逾 18 億 強化捷克廠產能佈局。自由財經，December 2022。Available at: https://ec.ltn.com.tw/article/breakingnews/4143073 (Accessed: 26 September 2025)。

3 吳康瑋（2024）。英業達捷克新廠登場！為歐洲「高階伺服器」產能添底氣。經濟日報，November 2024。Available at: https://money.udn.com/money/story/5612/8387716 (Accessed: 26 September 2025)。

4 林尚縈（2025）。德國 2024 外國投資報告 廣達新廠為台最大投資案。經濟日報，May 2025。Available at: https://money.udn.com/money/story/5612/8734898 (Accessed: 26 September 2025)

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