WHITE PAPER

IT Infrastructure

Toward resilient, secure, and autonomous IT infrastructures.

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The Era of Hybrid IT

Balancing agility, scalability, security, and data control.

Until a few years ago, IT infrastructures were considered merely an asset to enable business operations. Today, the growing dynamism of the market, which requires agility in responding to business challenges, has radically transformed the role of IT infrastructures. They have become strategic assets, with a significant impact on the flexibility, scalability, and efficiency of IT operations within organizations.

The increasing adoption of **Hybrid IT**, through the integration of on-premises environments with public and private clouds, has established itself as the reference model for organizations that need to manage distributed workloads while maintaining control over critical data and applications. By offering the right balance between agility, security, and governance, this model makes it possible to leverage the scalability of the public cloud without giving up the protection of sensitive data and critical workloads, ensured by on-premises or private cloud environments. The hybrid model therefore represents a strategic choice to ensure regulatory compliance and operational resilience, while at the same time preserving the flexibility and scalability required to support business competitiveness and adapt to market dynamics.

The recent spread of Hybrid IT is also closely linked to the growing need for **digital sovereignty**, which has become an essential requirement for all organizations, especially in light of recent geopolitical tensions. This requirement is driving the need to build new data centers or to host corporate data in dedicated infrastructures managed in compliance.This already complex scenario is further intensified by the

growing demand for computational resources, driven in particular by the rise of Artificial Intelligence workloads and, more specifically, **Generative AI**. These technologies are reshaping infrastructure requirements, driving the adoption of GPUs, AI accelerators, and advanced cooling systems, with significant impacts on both energy consumption and the environmental footprint of data centers.

Even before the widespread adoption of GenAI, and even more so with the emergence of these highly resource-intensive workloads, there has been a growing focus on data center sustainability. Energy efficiency, the use of renewable energy sources, and, more broadly, compliance with ESG standards have become essential criteria in corporate IT infrastructure decision-making. This has brought the concept of the **Green Data Center** to the forefront: IT facilities designed to optimize energy usage and minimize environmental impact through advanced cooling technologies and the circular reuse of energy resources.

The increase in both the number and installed capacity of data centers in Italy, combined with the need to ensure digital sovereignty, has made it necessary to introduce specific guidelines governing the construction of new data centers. These guidelines address not only regulatory compliance, but also environmental impact and access to power grids, with the aim of promoting infrastructure development that is sustainable and aligned with the country's energy and environmental strategies.

The evolution of AI, however, is not limited to increasing energy demands on data centers. While AI workloads are undeniably energy-intensive, it is equally important to recognize that AI is playing a transformative role in the management of IT resources and operations. Through AIOps solutions powered by machine learning and OCR technologies, organizations can enable predictive operations, autonomous optimization, and proactive incident resolution across distributed IT infrastructures, whether in cloud, on-premises, or off-premises environments. This, in turn, contributes to greater operational efficiency and a more optimized use of energy resources.

Within this increasingly complex context (defined by the convergence of hybrid operating models, rising computational requirements, regulatory pressures, and heightened focus on environmental impact) the demand for **flexible, scalable, and sustainable solutions**, both economically and environmentally, is rapidly growing. To respond to these challenges, organizations are accelerating the adoption of managed **IT services, as well as IT outtasking and outsourcing models**. In Italy, total spending on these services reached €9 billion in 2024, with forecast growth of 30% over the next five years. (source: Statista).

In the following sections, we examine the key drivers that are reshaping IT infrastructure architectures, from hybrid IT to automation and artificial intelligence, along a transformation journey that requires strategic vision, robust governance, and strong integration capabilities. The goal is to enable a business-first approach, in which IT is fully aligned with business objectives, requirements, and performance metrics.

02 Mastering IT Complexity

Strategic and organizational challenges

The evolution of IT infrastructures goes far beyond the technological modernization of IT assets. It requires a deep structural and cultural shift that directly affects an organization's ability to remain competitive, resilient, and responsive to emerging market opportunities. This shift reshapes the entire organizational ecosystem and demands a holistic, integrated strategy in which technology, governance, and economic sustainability mutually reinforce one another.

One of the primary drivers of this transformation is the increasing complexity and **heterogeneity of IT environments**. Modern architectures combine on-premises systems, public and private cloud platforms, edge environments, and infrastructures purpose-built to support AI workloads, introducing new layers of **operational and managerial complexity**. Organizations must orchestrate distributed, highly dynamic environments that require advanced and specialized skills, which are becoming both scarce and increasingly expensive to acquire.

As a result, enterprises are compelled to rethink how IT services are delivered and managed. In response to this scenario, there is a strong and growing shift toward **IT Outsourcing** models (Managed Services), which enable organizations to rely on a single strategic partner capable of orchestrating IT resources across multiple vendors and ensuring continuous optimization across the entire infrastructure. The adoption of these models reduces pressure on internal resource, allowing teams to focus on core business activities, while also providing access to highly specialized expertise and cutting-edge technologies capable of ensuring high levels of service quality, security, and scalability.

Beyond addressing skills shortages, these models also respond to a more sustainable financial logic. The adoption of managed services, together with the increasing diffusion of as-a-Service solutions, supports a shift from traditional capital expenditure, based investment models (**CAPEX**) toward an operating expenditure, oriented approach (**OPEX**). This transition is not merely a matter of efficiency, but a key lever to enhance agility and reduce the risks associated with incorrect sizing of IT infrastructures required to support business services. Integrated and centralized management of IT services and third-party vendors has therefore emerged as a priority for organizations, enabling cost optimization, faster resolution times, end-to-end monitoring, and continuous optimization. With the widespread adoption of hybrid IT models and the growing complexity of technological integration across IT infrastructures, it has become critical for enterprises to adopt DevOps approaches and agile methodologies in infrastructure management as well.

This is achieved through the extensive use of automation, leveraging Infrastructure as Code (IaC) and CI/CD pipelines to automate and standardize infrastructure management, monitoring, and continuous optimization activities. These practices reduce time-to-market and enable greater flexibility and scalability of IT infrastructures key differentiating factors in responding to increasing market dynamism.

However, increased operational flexibility must be supported by robust cost and performance governance. The rapid proliferation of AI workloads and the growing adoption of cloud resources can, in fact, lead to uncontrolled growth in IT spending, undermining the economic sustainability of the models adopted.

In this context, Observability solutions and **Cost Management Platforms (CMPs)** become essential to ensure cross-environment visibility, continuous monitoring, and predictive control of both performance and costs. When integrated with **AIOps** capabilities, these solutions enable automated operations, early detection of potential issues, and proactive resource optimization, reducing waste and **realigning IT with business objectives**.

Ultimately, the adoption of modern infrastructures also requires a deep transformation of organizational models. Defining an **IT Enterprise Architecture** aligned with business strategy ensures interoperability, supports innovation, and enhances the organization's ability to respond to change. IT therefore is no longer merely an enabler, but emerges as a strategic asset, an integral part of the company's long-term vision and a fundamental lever for sustainable digital transformation.

How IT infrastructures are evolving

Hybrid Cloud

The evolution toward increasingly advanced **Hybrid Cloud** environments makes it possible to balance the flexibility of the public cloud with the control and governance of private and on-premises environments. Modern platforms enable the **unified management of heterogeneous workloads** through multi-environment orchestration tools and policy-driven automation. **Advanced interconnection** services ensure operational consistency, secure data flows, and continuity in service delivery. These interconnections form the foundation for enabling hybrid cloud scenarios such as distributed disaster recovery, geographic workload balancing, and dynamic application migration with workload bursting to handle demand peaks. The resulting benefits include more agile and effective resource governance, reduced TCO, and improved alignment between infrastructure and business requirements.

Digital Sovereignty & Cloud Repatriation

The issue of **digital sovereignty** is prompting many organization, particularly in Europe, to reassess their cloud strategies. To mitigate geopolitical risks, ensure GDPR compliance, and retain control over strategic data, the phenomenon of **cloud repatriation** is gaining momentum: the migration of sensitive workloads from non-EU hyperscalers to local or sovereign **cloud environments**. This shift requires a rethinking of both infrastructure architecture and the physical location of data, while also creating opportunities to consolidate infrastructures and simplify regulatory compliance. The benefits include greater process transparency, reduced dependency on external providers, and stronger protection of critical digital assets, especially in highly regulated sectors and in organizations managing strategic data, such as public administration, healthcare, and financial services.

> The technological trends outlined in this document have been identified based on the information and analyses available at the time of publication, with an estimated time horizon of 1–3 years. The content is provided for informational purposes only and may evolve in response to technological, market, or regulatory developments.

Data Center AI-ready

The **rapid growth of AI and GenAI workloads** is driving a radical transformation of data centers, contributing to the emergence of facilities specifically designed to host these workloads. Traditional architectures are being replaced or complemented by **high-density computing environments**, equipped with AI accelerators, parallel and distributed storage architectures, and enhanced power delivery systems. Cooling has become a critical factor, with the increasing adoption of liquid cooling and immersion cooling technologies. These infrastructures are designed to support large-scale AI/ML model training and real-time inference, reducing bottlenecks and maximizing operational efficiency. Although they require significant investment, they enable substantial competitive advantages and support the delivery of high-value digital services.

Automazione & AIOps

The introduction of **AIOps solutions** is redefining IT operations. By enabling real-time analysis of logs, events, and metrics through machine learning algorithms, organizations can anticipate failures, automate incident resolution, and optimize resource allocation. This marks a shift beyond reactive operating models, enabling dynamic and predictive **IT governance capable of adapting in real time to system behavior**. The benefits include increased service availability, more efficient use of resources, reduced operational costs, and the reduction of repetitive tasks in favor of higher-value activities. Concrete use cases include predictive auto-scaling of cloud environments, continuous tuning of application performance, and automated patching and system updates, making IT governance more efficient, resilient, and scalable.

Green Data Center

Sustainability has become a strategic lever. **Green Data Centers** are designed to reduce environmental impact through the use of renewable energy sources, optimization of energy flows, and advanced low-consumption cooling systems such as liquid cooling, evaporative cooling, and heat recovery technologies. In some cases, the heat generated within data centers can be reintegrated into local district heating networks, contributing to improved urban energy efficiency. Operational efficiency is further enhanced through **workload optimization** techniques (e.g., green coding and energy-aware scheduling). These models enable organizations to comply with **ESG standards**, access fiscal incentives, and progressively reduce PUE (**Power Usage Effectiveness**), delivering not only economic benefits but also reputational value.

Edge Computing

The growing demand for real-time data processing is driving the adoption of **distributed architectures** that bring compute and storage closer to the data source. Edge Computing enables the autonomous management of data in **decentralized environments** through micro data centers and IoT devices, supported by high-capacity 5G networks. This approach enables mission-critical scenarios such as in-line quality control in manufacturing environments (smart factories), urban environmental monitoring (smart cities), autonomous vehicles, and predictive maintenance in industrial settings. The infrastructure impact is significant, requiring far-edge and near-edge nodes, IoT platforms, lightweight software specifically designed for edge deployment, and always-on connectivity. The benefits include lower latency, greater reliability, and a dramatic reduction in traffic to centralized cloud environments.

The evolution: The italian market for IT infrastructure services

9 out of 10

COMPANIES CONSIDER HYBRID IT THE IDEAL MODEL FOR BUSINESS; 6 OUT OF 10 HAVE ALREADY ADOPTED IT (2025).

33%

CAGR 2025–2030
DATA CENTER INVESTMENTS TO ENABLE AI WORKLOADS

77%

OF ORGANIZATIONS LEVERAGE OUTSOURCING OR OUTTASKING FOR IT INFRASTRUCTURE MANAGEMENT.

The rapid adoption of hybrid IT strategies, the growing relevance of Digital Sovereignty, and strong investments in AI within data centers are driving organizations to access advanced technological assets and capabilities in order to ensure secure, efficient, and resilient IT infrastructures.

18%

CAGR 2025 - 2030
ADOPTION OF DATA CENTER AUTOMATION SOLUTIONS.

84%

CIOS/CTOS CONSIDER DIGITAL SOVEREIGNTY A DECISIVE CRITERION IN VENDOR SELECTION.

+ HYBRID IT MANAGEMENT
+ AIOPS & AUTOMATED IT OPERATIONS
+ CYBER RESILIENCE & DATA SECURITY
+ DEVSECOPS APPROACH

TOP 3 BUSINESS NEEDS

Data that is increasingly protected and compliant with regulations

Greater operational agility and simplified management through AIOps

AI- and automation-optimized infrastructures for higher efficiency and innovation

Integration and processing of multi-source data (e.g., Statista).

04 Our Approach

Engineering's Data Center Transformation services portfolio includes the full range of IT infrastructure services designed for large organizations across both the public and private sectors. The portfolio builds on over **twenty years of experience** supporting clients in the management of IT infrastructures and in the operation of **three proprietary Data Centers**. Engineering has developed a proven approach for the onboarding and management of these services, leveraging leading frameworks (such as ITIL and Cobit) to ensure IT governance is fully aligned with business objectives.

Our portfolio follows **a modular and complementary approach**, covering the entire **end-to-end** spectrum of services for hybrid IT infrastructures. Services span the full application architecture stack: from **facilities and data center services**, to system services (network, systems, storage), through virtualization platforms (private cloud), and up to **Database and middleware layers**. In addition, through a dedicated **Business Resilience** service line, we are able to ensure operational resilience by implementing advanced cyber-resilience strategies. We support our clients throughout every phase of adoption, from **advisory and design**, to implementation, and through to integrated and automated operations management, across any deployment model (on/off-premises, or Eng-hosted). Our portfolio is further strengthened by expertise that extends beyond **On-Premises infrastructures** to include cloud environments, integrating infrastructure management capabilities with application-layer expertise. This allows us to effectively address the needs of organizations adopting hybrid IT models, particularly those requiring high levels of data security for critical assets and compliance with European and national regulations.

Eng Cloud Services Portfolio

Smart Workplace

Optimize workforce productivity and efficiency to foster digital transformation

- AI-Powered (Virtual) Service Desk
- Digital Workplace
- Intelligent (AI) Process Automation

Journey to Cloud

Modernize apps to achieve scalability and flexibility with public & hybrid cloud

Cloud Strategy

- Cloud Strategy (extrared)

Cloud Migration

- Cloud Security
- App Cloud Modernization (Re-Host, Re-Platform, Re-Architect) (extrared)

Cloud Management

- Multi-Cloud Ops
- DevOps / GitOps (extrared)
- FinOps

Data Center Transformation

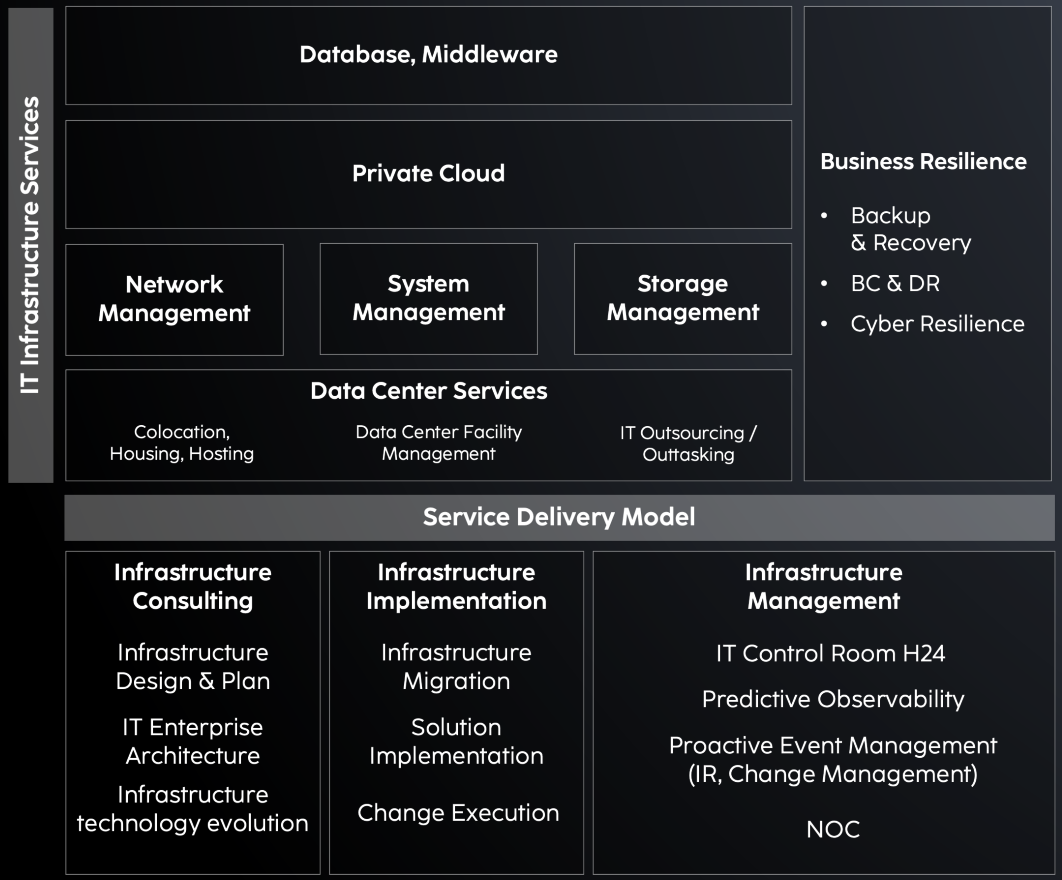
Ensure data resilience and sovereignty with secured and automated IT infrastructure

Hybrid Infrastructure Management

- Data Center Services
- Network & Systems
- Private Cloud (extrared)
- DB, Middleware (extrared)
- Storage, Backup & Recovery
- Business Resilience (BCDR)

TECHNOLOGY PARTNERS

aws, Microsoft, Google, ORACLE, Red Hat, vmware, DELL EMC, NetApp, ZABBIX, COMMVAULT, dynatrace, VOCALCOM, easyVISTA, overIT, ivanti, NICE, UiPath, blueprism, VEEAM, kubernetes



Data Center Transformation Services

Looking more closely at our offering, we begin with services dedicated to IT facilities (Data Center Services). We provide our clients with **Colocation**, **Housing**, and **Hosting Services** across any type of hardware, supported by **three proprietary Data Centers** and dedicated spaces, ranging from server farms to controlled-access cages and bunker environments.

In addition, we support customers throughout the entire lifecycle of **IT infrastructure management**, from the design and construction of data centers, to the definition of migration plans into our proprietary facilities, and through to full operational management. This enables both IT outtasking and outsourcing models, while ensuring the highest standards of security, resilience, and sustainability.

To complement our data center services, we have developed a comprehensive portfolio of systems management services, covering the operation of all major hardware technologies for servers, storage, and network assets. This offering leverages a strong ecosystem of technology partners and the consolidated expertise of our teams. Our portfolio also includes a full range of services for the design, implementation, and optimization of corporate **LAN and WAN networks**, ensuring network segmentation and security (Network & Security). Through deep network engineering expertise, we enable fast and secure access to data and applications across any deployment model. Finally, we provide managed services to continuously optimize performance and security through our Network Operations Center (NOC), ensuring integrated and proactive

management of network assets such as switches, routers, firewalls, and access points. Thanks to advanced network configurations, we are also able to deliver implementation and migration services for **virtualization platforms** (hypervisors). We support the migration and configuration of virtualization environments designed to achieve cloud-like benefits within a private cloud model, leveraging automatic scalability and agility, also enabled by our proprietary private cloud as-a-service solution (Eng Cloud).

The offering is further complemented by services for the design, implementation, and management of databases of any type (**both SQL and NoSQL**) to support transactional and analytical workloads. These services ensure integrated and automated backup, migration, and query management. Through a 24/7 operational IT Control Room, we continuously manage and monitor these services, leveraging AIOps tools to enable centralized, extended, and proactive governance of all IT infrastructure assets, with a focus on optimizing both effectiveness and efficiency.

To ensure operational resilience, the entire offering is complemented by Business Resilience services. Leveraging extensive experience in the design, implementation, and management of Data Protection strategies, Engineering is able to support clients across the full spectrum of protection requirements, from basic Backup & Recovery activities to the most complex **Business Continuity (BC) and Disaster Recovery (DR) scenarios**, including advanced protection needs for critical and strategic data through our Cyber Resilience solutions to counter cyber threats and ransomware attacks.

These scenarios can be addressed across any deployment model, whether on-premises, off-premises (within Engineering data centers or third-party facilities), or cloud environments, supported by consolidated expertise and a broad portfolio of proven success stories in the design, implementation, and management of hybrid environments. All of these services can also be delivered through full outsourcing models within our three proprietary data centers, ensuring high levels of security and performance.

For customers requiring **DR and BC capabilities** on secondary sites, our infrastructures can be leveraged to maintain the highest security standards and regulatory compliance, without the need to manage additional facilities. Furthermore, drawing on our vertical expertise in managing full public cloud environments and advanced cybersecurity capabilities, we provide integrated management of full hybrid IT environments (public, private, and on-premises), adopting a security-by-design approach across the entire infrastructure services portfolio.

Our managed services governance model is aligned with agile and **DevOps practices**, leveraging AIOps to optimize operations across the entire IT infrastructure stack, ensuring efficiency, resilience, and scalability.

Eng Data Center

PONT ST. MARTIN

Surface: **2800m²**

Power Capacity: **1048 kW**
Potential Expansion: **+1310 kW**

Cooling: **Geothermal System, Direct Expansion**

Certification: **Rating III TIA 942B**

Highlight: **22 bunker autonomi ad accesso controllato**

TORINO

Surface: **350m²**

Power Capacity: **90 kW**
Potential Expansion: **+226 kW**

Cooling: **Direct Expansion**

Certification: **TIER II** (non certified)

Highlight: **Backup quasi sincrono con Pont St. Martin**

VICENZA

Surface: **770m²**

Power Capacity: **380 kW**
Potential Expansion: **N.a.**

Cooling: **Free Cooling System, Direct Expansion**

Certification: **Rating IV TIA 942B, Uptime Institute**

Highlight: 2 sale dati indipendenti

ENGINEERING BACKBONE: Multi Carriers Wide Connectivity & Cloud Exchange

CERTIFICAZIONI

Certificate for critical PA data: QI2 (Data Center) and QC2 (Private Cloud)

vmware CLOUD VERIFIED

ISO

ISO/IEC 27001:2013
ISO14001:2015
ISO 9001:2015
ISO 14064:2018
ISO 45001:2018
ISO 14064:2018
ISO 22301:2019
ISO 20001:2018

Focus On

Pont-Saint-Martin: A best-practice example of a green Data Center

In today's context of growing focus on environmental sustainability and energy efficiency, the **Pont-Saint-Martin** site represents a concrete example of how technological innovation and environmental responsibility can be successfully combined in the design and operation of a **Green Data Center**. The sustainability of the Pont-Saint-Martin Data Center is ensured by 100% **renewable energy** supply and a geothermal energy–based cooling system with circular resource utilization, enabling the achievement of a highly efficient PUE. The facility features two fundamental, interconnected systems, each designed to maximize efficiency and minimize environmental impact:

- **Cooling System:** Based on geothermal hydronic energy in a semi-closed loop, this system is the defining feature that makes the facility unique. Each bunker is equipped with an autonomous system comprising two heat exchangers and two direct-expansion backup units. Cold groundwater (11–12°C) is drawn from four wells and used to maintain a stable internal temperature of 24°C through cooling processes. The resulting warm water is then discharged into the Lys River, ready for reuse.

- **Thermal System:** A multi-purpose unit enables the recovery of warm air generated by the server rooms, which is reused for heating and cooling office spaces. Gas-based systems are activated only under extreme climatic conditions, contributing to a significant reduction in emissions.

Supporting the entire infrastructure is a unified and centralized monitoring system for all Engineering data centers (BMS), capable of monitoring all data center assets and detecting temperature fluctuations, fires, and flooding. Real-time alerts are sent to a **24/7** active operations control center. This integrated approach ensures energy efficiency, operational security, and environmental sustainability, positioning Pont-Saint-Martin as a benchmark for future Green Data Center implementations.

Discover More →

Ensure IT physical and virtual assets efficiency & scalability while enforcing business continuity

Design, implementation and management of network, IT facilities, systems and applications to grant a resilient IT infrastructure on/off-premises and in private cloud.

ENG Data Centers

- Pont-Saint-Martin (Green DC)
- Vicenza (Tier IV)
- Torino (DR with PSM)

ISO27K, ACN QI2, QC2 certified

Control Room

24/7 remote support on all infrastructure services

2,8k
Managed DBs on public or private cloud

+21k
Servers owned (86% VMs, 14% racks)

+16k
Network Assets Connected and managed (Firewalls, Routers, switch)

+20k
TB data stored on-premise / private cloud infrastructures

+19,5k
Servers managed on-premise (ENG DCs) and off-premise (Client / 3rd party)

+400
Network Lines WAN/LAN managed by dedicated NOC

200+
Active Enterprise customers

800+
Specialized Professionals

10
Key strategic partnerships

DELL EMC · HITACHI · bmc · NetApp · Microsoft Hyper-V · vmware · VEEAM · COMMVAULT · ORACLE

ADVISORY · IMPLEMENTATION · MANAGED SERVICES

- DATA CENTER SERVICES
- NETWORK & SYSTEMS
- PRIVATE CLOUD
- DB, MIDDLEWARE
- DATA PROTECTION

05 Our Stories

CASE STUDY | FINANCIAL SERVICES

End-to-end IT Infrastructure Management for a leading payments company

Eng delivered a comprehensive IT infrastructure management model covering all critical components, including databases and systems, middleware, SAP Basis support, network management, and centralized incident management through a single Help Desk acting as a single point of contact.

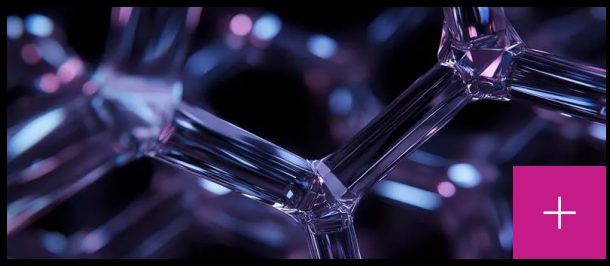
The service was complemented by continuous proactive monitoring, scheduled maintenance, and configuration optimization, ensuring increased resilience, reduced downtime, and an overall improvement in operational performance.

CASE STUDY | TRANSPORTATION

Comprehensive and reliable management of complex IT infrastructures

A major maritime operator, undergoing rapid international expansion, required secure and reliable management of its hybrid IT infrastructure. Engineering implemented a proactive operating model based on continuous monitoring, event management, scheduled maintenance, and coordinated vendor management, ensuring maximum service continuity and reduced operational risk.

The solution integrates continuous configuration and update management, periodic backups, centralized asset management, up-to-date documentation, and performance analytics tools. This approach delivered tangible benefits, including enhanced operational resilience, reduced downtime, optimized management costs, and more transparent and reliable governance of IT infrastructures.



CASE STUDY | GOVERNMENT

Full IT Outsourcing for a Leading Airport Management Company

Through close integration between Engineering's team and the client's IT organization, a comprehensive Full IT Outsourcing service was established, encompassing the provision of software and hardware solutions as well as the operational management of all infrastructure components. The engagement covers the client's entire IT ecosystem. Engineering manages the infrastructure end to end, including the client's proprietary Data Processing Center (DPC), ensuring service continuity, performance, and security. At the same time, leveraging its own data centers, Engineering is responsible for the planning, provisioning, and management of the Disaster Recovery infrastructure, guaranteeing high levels of resilience and defined recovery times.

The project also includes the design and delivery of major transformation and evolution initiatives across the IT environment, with the goal of modernizing infrastructures, improving efficiency, and more effectively supporting the client's business needs.

CASE STUDY | GOVERNMENT

End-to-end management of Hybrid Infrastructures for an Italian Ministry

Within an Italian Ministry operating one of the most complex IT infrastructures in the public sector, comprising two proprietary data centers and multiple cloud environments, Engineering manages more than 5,000 servers, 3,500 network devices, and 3,000 email accounts. The fully customized service covers all critical components, including databases, middleware, system management, storage, backup, and monitoring, as well as the centralized management of key operational platforms.

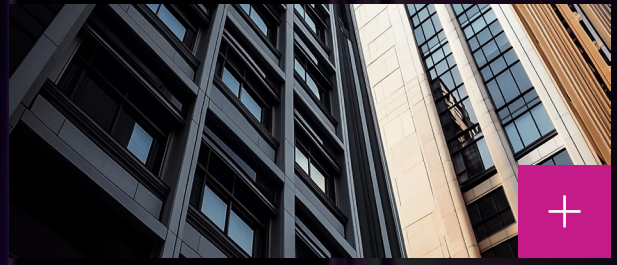
Activities include installations, upgrades, performance optimization, and the management of incidents and problems. All services are supported by centralized monitoring integrated with leading ticketing tools, ensuring operational efficiency, reliability, and continuous technological evolution.

CASE STUDY | INFORMATION SERVICES

Managed Services and Disaster Recovery for IT System Continuity

For a leading operator in the information services sector, Eng has implemented a remote system and application management service at the Pont Saint Martin Data Center. The monitoring console and operational services have been made available in a redundant setup across three other Eng Data Centers, totaling four sites, to ensure operational continuity and compliance with SLAs and KPIs.

The solution was completed with a Disaster Recovery project and a governance model that, through dedicated Project Managers and a single Program Manager, ensures the client a centralized interface and effective control over all critical areas.



Focus On

IPCEI AVANT

IPCEI AVANT, a European project based on a shared cloud platform (IPCEI-CIS AVANT)

With the AVANT project, Engineering participates in the first IPCEI (Important Projects of Common European Interest) aimed at creating a European value chain for next-generation Cloud Infrastructure and Services within the IPCEI Edge-Cloud Continuum (IPCEI CIS). The project focuses on building digital value chains through the federation of Edge-Cloud services and infrastructures from multiple providers, in line with the EU programme for the deployment of more than 10,000 edge nodes. With AVANT, Engineering focuses on two interconnected research streams:

+ **Digital Twin as a Service**: making Digital Twins scalable and accessible across multiple industries
+ **Cloud Cognitivo**: creating federated and flexible ICT infrastructures, improving sustainability and efficiency without compromising performance (intent-based computing)

The AVANT project addresses several emerging opportunities driven by the evolution towards increasingly hybrid, distributed and European infrastructures, as well as by the growing role of automation in IT operations. In particular, the cognitive cloud research stream supports the intelligent and optimal use of cloud-edge resources across the digital continuum, providing AIOps capabilities for:

+ discovery and optimal deployment in heterogeneous and dynamic environments
+ monitoring and control of distributed resources
+ orchestration, deployment and execution based on predefined policies, including energy efficiency, SLAs and reputation

This approach enables intelligent and adaptive management, ideal for tackling the complexity of Edge and Hybrid IT, improving resilience and transforming infrastructure into a platform capable of supporting advanced decision-making and automation, increasingly closer to the data source.Projects of this kind are essential to keep business processes aligned with best practices that require ever-greater integration between IT and OT processes, aimed at delivering advanced (cognitive) services in massively distributed environments.

Discover More →

The Future of IT Infrastructures

In the coming years, IT infrastructures will evolve toward models that are increasingly specialized, intelligent, and sustainable. Technologies such as HPC and Quantum Computing will push the boundaries of computational capacity; data centers will become increasingly autonomous through distributed AI agents; and more environmentally efficient architectures will emerge, ultimately evolving into climate-positive infrastructures.

At the same time, new distributed models, such as micro data centers, will emerge, while the role of mega digital infrastructures as the backbone of digital transformation will continue to strengthen. Anticipating these trends is essential to building resilient, scalable infrastructures that are ready to support innovation over the long term.

The Rise of HPC and Quantum Computing

In the coming years, the growing adoption of AI and GenAI applications, engineering simulations, financial modeling, and quantum algorithms will drive the diffusion of high-performance, **specialized infrastructures**. Heterogeneous environments will emerge, integrating general-purpose **CPUs, GPUs, and QPUs (Quantum Processing Units)**, with architectures capable of simultaneously supporting classical and quantum workloads.

Low-latency interconnections, distributed NVMe-over-Fabrics storage, and liquid cooling systems will become standard in HPC clusters and AI-ready data centers. These evolutions will enable new models such as Quantum Computing-as-a-Service and will require new skills in job scheduling, multi-platform orchestration, and high-density resource optimization.

From Green Data Centers to “Climate-Positive DC”

The goal of future infrastructures will no longer be limited to reducing energy consumption and emissions, but will extend to generating a positive environmental impact. **Green Data Centers** will evolve into carbon-negative ecosystems, enabled by energy storage solutions, heat reuse, exclusive adoption of renewable energy, and on-site CO_2 emission compensation through Distributed Energy Resources.

Innovative materials, advanced thermal management technologies (including liquid cooling), and modular design will become standard. AI-driven energy management systems will enable dynamic consumption optimization and automated responses to workload fluctuations. In parallel, next-generation DCIM solutions will monitor environmental impact in real time, embedding sustainability as a core metric of IT operations.

Self-Managed Infrastructures and AI Agents

Future infrastructures will increasingly become **self-managed**, powered by **distributed AI agents** capable of autonomously executing operational activities, diagnostics, and decision-making. These agents will handle provisioning, scaling, predictive maintenance, energy optimization, and compliance without human intervention.

Advances in machine learning federated models and edge AI inference agents will enable real-time processing of sensitive data and autonomous decision-making even in decentralized environments. AIOps will evolve toward intent-based models, where infrastructures understand business objectives expressed in natural language and automatically configure the appropriate level of automation. What is currently experimental will become essential to ensure resilience, efficiency, and rapid response in highly competitive business contexts.

Mega Digital Infrastructure

In the near future, large, interconnected **digital hubs will emerge**, centralizing data, computational capacity, and critical services, becoming pillars of national and European digital transformation. Designed to host cloud environments, AI platforms, and large-scale neural networks, these infrastructures will be tightly integrated with ultra-high-capacity backbones, advanced interconnection systems, and multi-tenant architectures.

They will enable federated operating models and support the concentration of strategic services. Their systemic relevance will require the highest levels of security, energy efficiency, digital sovereignty, and regulatory compliance. Thanks to scalability and economies of scale, these infrastructures will reduce TCO and improve access to advanced digital services, accelerating enterprise competitiveness and the modernization of public services.

Micro Data Centers & Distributed IT

Alongside large central hubs, distributed IT architectures will continue to gain ground, based on **micro Data Centers, modular containers, and edge nodes**. These compact and scalable environments will be deployed close to data sources to ensure local autonomy, operational continuity, and low latency.

They will enable real-time processing that is critical for use cases such as industrial automation, intelligent energy grid management, urban mobility, and territorial security. Integration with 5G technologies, IoT sensors, and edge AI models will further enhance resilience and flexibility in decentralized contexts. Remote management and automation of these micro environments will reduce operational complexity and open up new business opportunities across logistics value chains, peripheral territories, and areas where traditional centralized infrastructures are not feasible.

07 Key Takeways

1 From infrastructure to impact

IT infrastructure is now a key enabler of digital transformation, no longer merely a technological asset. Platform modernization, workload integration, and operational automation are the pillars on which resilience and business continuity are built. Organizations that adopt flexible, data-driven architectures are able to turn technological capabilities into a competitive advantage, accelerating innovation, strengthening security, and reducing time-to-market.

2 Hybrid ecosystems at the core of IT strategy

The adoption of hybrid and multi-cloud models is now essential to effectively address the need to combine scalability, security, and control. The interconnection of public, private, and edge environments enables workloads to be distributed according to performance, cost, and compliance requirements. Centralized governance and automated service orchestration make it possible to manage heterogeneous resources coherently, creating a digital continuum that drives innovation and operational agility.

3 Digital sovereignty as a competitive advantage

Control over data and infrastructure has become a strategic priority. Growing attention to compliance, data localization, and technological independence requires architectures designed around the principles of digital sovereignty. The adoption of sovereign clouds, national data centers, and federated data management models ensures regulatory adherence, transparency, and security, essential elements for building trust and operational continuity within complex ecosystems.

4 Infrastructures become intelligent

The adoption of AIOps, machine learning, and predictive automation is transforming infrastructures into systems capable of continuous learning and adaptation. AI becomes an architectural element, integrated into monitoring processes, capacity planning, and incident management. The shift toward self-healing and self-optimizing models reduces response times, optimizes resource usage, and improves service quality, introducing data-driven governance based on real-time observability.

5 Toward context-aware infrastructures

The evolution of IT architectures is moving toward autonomous and adaptive models, built on distributed intelligence and local decision-making capabilities. AI agents and intelligent orchestration platforms will enable the creation of self-managed infrastructures, capable of understanding business objectives, optimizing workflows, and preventing critical issues. At the same time, energy and environmental awareness becomes an integral part of the operational lifecycle, with efficiency and sustainability metrics embedded into day-to-day management. The result is a context-aware infrastructure, designed to operate dynamically and sustainably across its entire lifecycle.

6 The era of Green IT

Sustainability becomes a core design requirement for IT infrastructures. New generations of data centers adopt high energy-efficiency technologies, liquid cooling systems, heat recovery, and integration with renewable energy sources. In parallel, practices such as green coding, intelligent virtualization, and proactive energy monitoring enable organizations to measure and reduce the environmental footprint of IT, aligning performance with responsibility. Green IT thus becomes a tangible indicator of both operational efficiency and infrastructure sustainability.

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