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DATA CENTERS

TECBOMO

Customer Solution Brief

Trustworthy Transformation

An overview by Iron Mountain Data Centers (IMDC) of the current infrastructure challenges, drivers and opportunities for enterprises in the process of digital transformation

Contents

Solution snapshot

This IMDC solution overview sets out the key drivers and challenges influencing infrastructure strategies for enterprises in the process of digital transformation, with a particular focus on the role of colocation.

Key Infrastructure Considerations

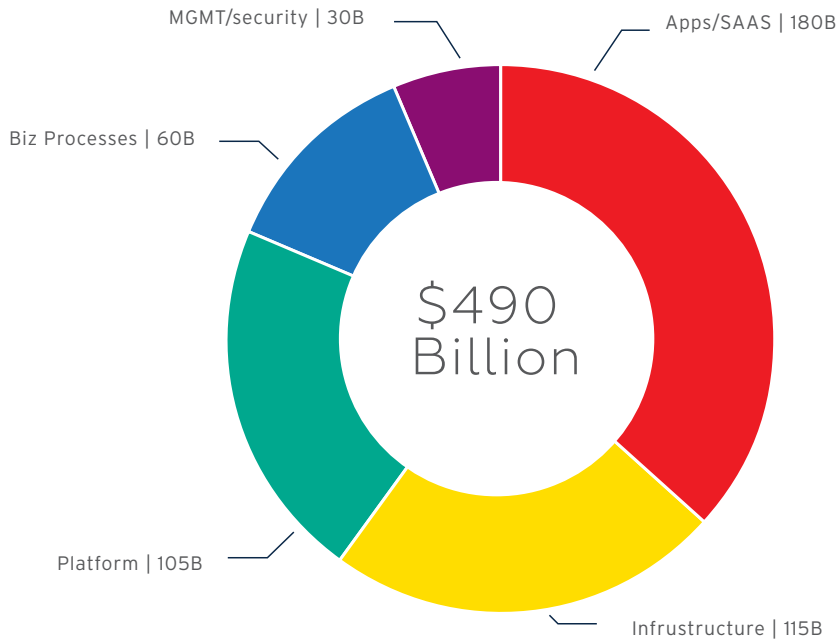
Navigating the Cloud

With lockdowns, inflation, supply chain issues and war in Europe, it has been hard for businesses to steer a steady course over the past few years. However, two things are certain; IT spend continues to rise and everyone is heading into the cloud in pursuit of digital transformation.

- According to IDC, for the first time ever, the majority of enterprises (53%) have an enterprise-wide digital transformation strategy, an increase from 37% only two years ago.
- Gartner estimates that public cloud services now account for around $500 billion, or just over 10% of global corporate IT spend (up from 4% in 2017).
- Public cloud apps (SaaS) generate almost $200 billion a year. The IaaS and PaaS markets are both worth over $100 billion with the highest forecast CAGR. And business processes, security and management services are approaching $100 billion.
- Private cloud – the proprietary component of what Forbes describes as the new 'software economy' - is moving just as fast, with CAGR of 29.6% and a value of $130 billion.
- According to Microsoft, over 95% of new digital workloads will be deployed on cloud-native platforms by 2025, up from 30% in 2021.
- Everything is becoming a service; according to IDC 61% of organisations worldwide are interested in shifting to consumption-based models for IT investments rather than capital-intensive purchases.

Global Public Cloud Spend

Source: Gartner



Pick Your Platform(s)

The wholesale shift of IT to the cloud is clearly both cost-effective and liberating. However, despite the prevalence of the cloud metaphor, this is all taking place in the real world and is therefore subject to the laws of physics. Platforms matter more rather than less in this environment. As enterprises accelerate their transition to a multi-cloud-based model, CIOs, CTOs, CDOs and CISOs have to tread a fine line between new and old, freedom and standards, agility and resilience.

Because legacy equipment, apps and systems continue to be relied on by customers, partners and staff, the digital transformation task is a bit like changing the wheels while on the move. Clearly cloud-native services are the answer, but which clouds are the best bet, how do you reach them securely, and what if you want out? How do you protect and leverage your proprietary data in these environments? And how far and how fast will your data need to travel in future?

There is also the burning question of environmental impact. The platforms you choose need to reflect your core values as well as those of an increasingly concerned and well-informed customer and investor base. Will they help you to meet your stated goals and decarbonize your operations, or will they cause embarrassment and undermine your right to operate?

This publication draws on IMDC's colocation expertise as well as a range of other industry sources to assess infrastructure needs for businesses. It attempts to set out an infrastructure that is as secure, reliable andethical as possible at the same time as flexible and agile enough to enable leadership in the software economy. Our main objective is to ensure that your new digital architecture will serve you well - not just today, but for years to come.

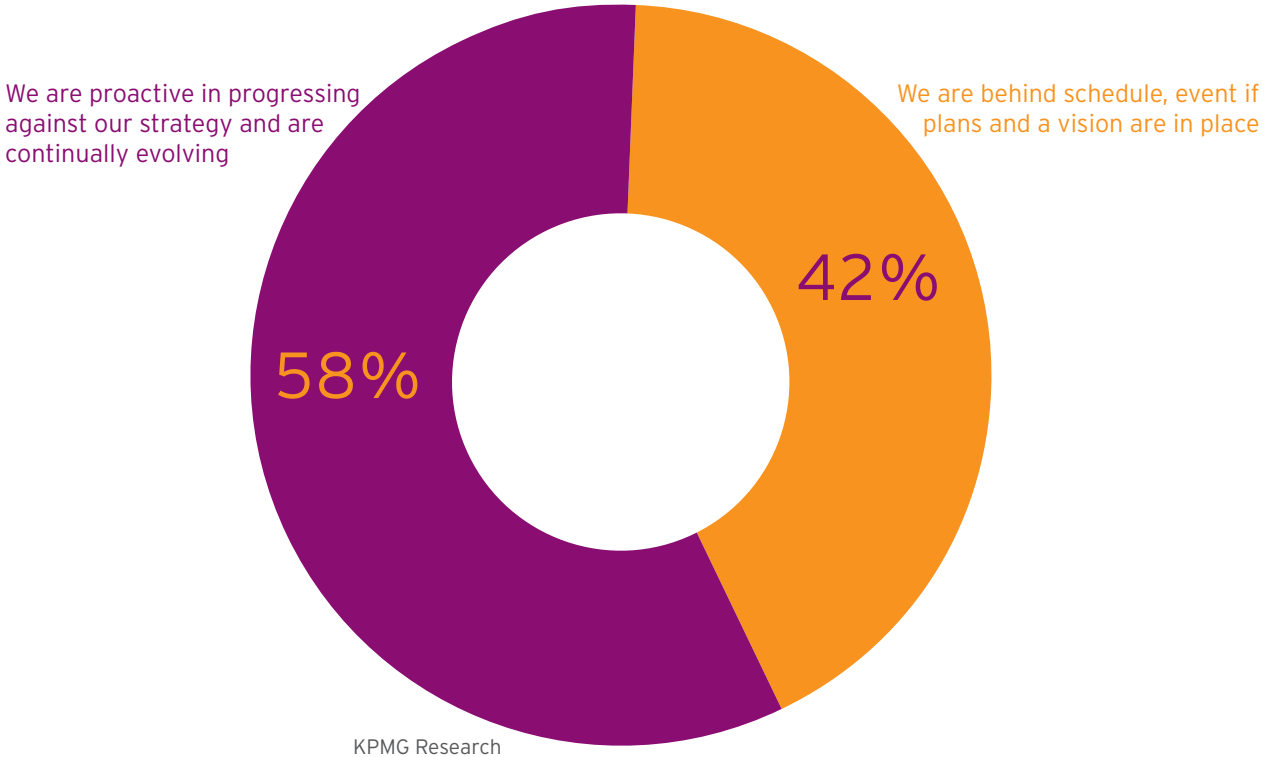
Top 10 Drivers

1 Data Security

Customers need to know that they can trust c ompanies with their sensitive data - and the number of high-profile breaches clearly demonstrates that this is currently far from the case. With the growing adoption of cloud services and IoT-based solutions, cybercrime is rising. Most business processes are migrating to the cloud, and organisations are becoming more physically dispersed, all of which increases the overall threat landscape. This is set against a backdrop of increasing data regulation; Gartner predicts that by end 2024, 75% of the world will have their personal data protected by law.

However, progress towards new zero-risk access models that operate more effectively across multiple clouds is slow. As companies pursue their digital transformation strategies, the new technologies they deploy will need to be demonstrably secure and founded on the most rigorous international standards.

How Would You Describe Your Organization's Position Today in Your Cyber Security Journey?



KPMG Research

2 Multi-Cloud Capability

According to Flexera, 89% of organisations currently use multiple cloud providers. Companies will want to use different clouds to develop specific application components. Using the strengths of each cloud, companies can optimise application developmentfor the best possible user experience. The ability to move between platforms is becoming increasingly importantfor digitally mature businesses. In the cloud, as in mainframe computing, new solutions quickly become legacy technologies, and businesses don't want to be tied down by legacy technology.

Insufficient interoperability and lack of on-ramps can hamper multi-cloud performance. Service providers will need to develop applications that run across multiple cloud environments natively and roll out hundreds more on-ramps in strategic locations to expand their availability.

3 Cloud Complexity

A major pain point with the multi-cloud approach – and digital transformation as a whole - is the increasing complexity of cloud applications, data orchestration, and billing management. As well as the CSPs themselves. companies like CloudFix, Cloudwiry and Zesty are now offering to help customers simplify and improve the efficiency of their cloud use.

Complexity extends to cloud skills (e.g. skilling up at board level to understand digital potential, a key issue) and democratising innovation by enabling people without a degree in computer science to come up with workable ideas for new services using low-code/no-code tools like Zapier and Microsoft's Power Platform. According to Gartner, 70% of new applications developed by organisations will use low-code or no-code technologies by 2025, up from less than 25% in 2020.

4 Automation

New services continue to launch, designed to make the life of the enterprise easier and allow it to focus on business development. XaaS or 'everything as a service', has expanded to include storage, containers, functions, security, unified communications and video, among other things. As the barriers to cloud adoption – security, lack of resources and expertise, cloud spend management, for example – continue to fall, this list can only get longer.

At the infrastructure level, the Covid pandemic has spotlighted the need for efficient and reliable remote operation. This applies across all information management processes from scanning and ML upload to equipment lifecycle management, and remote operation/Smart Hands for migrations, maintenance and interconnections in and between data centers.

Fundamentally, each of these new types of vendor offerings provide enterprises with an option for shifting some aspects of day-to-day digital infrastructure operations, and lifecycle management, to third-party vendors and service providers, including channel partners. According to IDC 73% of large enterprises (1000 employees or more) plan to use flexible, pay as you go OpEx consumption models for most of their digital infrastructure and cloud purchasing going forward.

Top 10 Drivers

5 Partnership

Strategic and channel partnerships, startup investments and acquisitions are driving innovation and new services. This also covers a wide range of support service providers; security, content partners, logistics, market and risk data and news all add value to the mix. Cross-sector partnerships (points, loyalty cards, cashback) constantly uncover new pockets of value. New cloud-based services cross industry lines and deliver profits fast. These digital partnerships require open-source interoperability and easy interconnection as well as seamless scalability.

6 Analytics, AI & MI

Companies are awash with data, both structured and unstructured, and a key component of digital transformation is finding how to unlock business value from this data, preferably in real time. Effective analytics use algorithms to identify patterns and elucidate underlying processes, with the aim of improving an organisation's performance. Training these algorithms to trigger or perform new operations requires AI and ML, and the effective use of these technologies is the critical factor in driving the virtuous cycle of analysis and action that characterizes effective digital transformation.

Cloud-driven AI and ML are already mainstream, but they will grow more important and drive competitive advantage, making firms more intelligent about customer needs, and triggering customer transactions. Because AI/ML self-learn, and accumulate knowledge at a high speed, the sooner they are up and running the greater the competitive advantage.

7 Bots & Omni-Channel

Linked to the above, AI-driven bots are handling an increasing proportion of customer enquiries. These will operate across more and more channels. Many firms are building their ability to seamlessly switch between different communication channels (mail, SMS, chat, messengers, voice) and form a single seamless thread for a client.

Top 10 Drivers

8 AR/VR

Consumer touchpoints are becoming more feature-rich, personalized and interactive, adding game-style features to engage and support customers. At the same time, some firms are focusing on the metaverse, renting virtual real estate to replace high street bricks and mortar and allowing customers to meet virtually and communicate with staff, as well as transact. While there is still considerable debate around the nature of the Metaverse, there are already major advantages to be gained from the enrichment and 'gamification' of consumer apps.

9 Internet Of Things

IoT is the base of a whole new generation of manufacturing and consumer services. It can also be the source of a whole new set of security headaches. And data levels are phenomenal. Like AR and VR, IoT requires huge levels of bandwidth and processing in the field and towards the edge, plugging into 5G networks and micro-data centers to speed up service and avoid traffic bottlenecks.

10 Decarbonization

According to Accenture, 44 percent of CEOs are already planning net-zero futures for their organisations. Trust is at the heart of every leading brand, and proactive environmental responsibility is now a critical factor in building and retaining consumer trust.Public cloud businesses like Google, Amazon and Microsoft have made great strides in decarbonizing their operations, as have many of the leading colocation providers.

There is much more to do here. For many businesses, monitoring and reporting of Scope 3 (supplier) emissions is far behind reporting on Scope 1 and 2. Cloud and colocation infrastructure providers are working hard to provide certified operational GHG data to meet this need. At the same time, completely decarbonized power for ITand virtuous planning and analysis cycles for embodied impact are ecoming available.

Key Infrastructure Considerations

Public & Private: The Hybrid Journey

The industry is still mid-move. Housing more of the world's structured enterprise data than any other platform, mainframes continue to drive a significant portion of mission- critical workload for big business. According to IBM, they are used by 44 of the top 50 banks, 10 of the top 10 insurers, and 18 of the top 25 retailers. For larger enterprises with existing systems the first step to a pure cloud play is migration of the legacy equipment and systems you still need to virtualized servers in a modern, cloud-and-partner-rich third-party facility. In other words, a hybrid infrastructure model

There is still a surprising amount of on-premise infrastructure that is either incompatible with cloud services or requires higher security than the cloud can provide. As part of the transformation of Capex to Opex, these in-house data centers need to migrate from the office basement to a colocation facility, where reliability and efficiency continuously improve, where API partners and the cloud(s) live, and where infrastructure overheads can be reduced, sometimes by as much as 30%.

The in-house to colocation shift is even more relevant post-Covid, as company offices evolve to a hybrid working model, and real estate outlay shrinks.

Hybrid businesses are succeeding in the market as they can offer the best of both worlds; increased efficiency and innovative services along with reliable customizable systems and backstops.

Security & Standards: Guaranteeing Compliance

Money and valuable market and customer data move around in a fast-evolving (and expanding) threat landscape. There has been a high-speed shift from perimeter security to a multi-point cloud-driven zero trust model where users are authenticated, authorized, and continuously validated. Your organisation's framework needs to be supported by all professional points of contact – suppliers, cloud service providers, networks and data center infrastructure providers.

Compliance is also complex. There are a multitude of international and national regulations that constantly evolve, making practical security and compliance time-consuming. GDPR (UK & EU), SOX, BSA, GLBA, FINRA and the OSFI all need to be satisfied to ensure secure, compliant international online operation.

At the infrastructure level, data center uptime, resilience, DR and physical security need to meet the most exacting standards to support transactions. Tier 3 facilities with redundant and resilient infrastructure and failproof configuration are non-negotiable. Comprehensive physical and data security layers shouldguard your vital assets. In some cases extreme security is required: for maximum physical security underground facilities offer even greater protectionfrom intrusion and natural disasters.

The Payment Card Industry Security Standard (PCI DSS) is a key certification for colocation providers, covering storage, processing, and transmission of cardholder data. As the dotted lines between industries are broken, a wider range of industry-specific operational and security standards will also be useful. When exploring colocation options, a broad checklist of multi-sector third party certifications is a good indicator of reliability. Look for ISO 27001, SSAE18 SOC 2 (Type II)/SOC 3*, and ISO -50001. Region-specific certifications are also key for multi-region businesses; in North America, NIST SP 800-53*, FISMA HIGH, FedRAMP and HIPAA (Type I); OSPAR in Asia; ISO 450001 and 9001 in EMEA.

HITRUST · FedRAMP · Green Lease Leader · PCI DSS Compliant · NIST

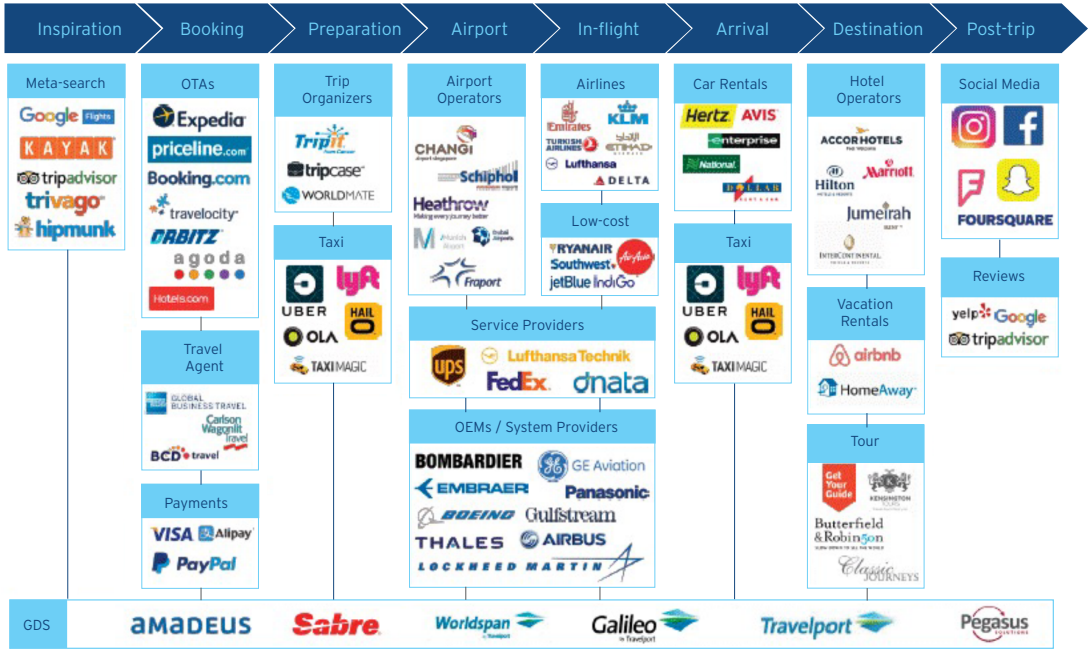
AICPA SOC · HIPAA Compliant · ISO 9001 Certified by schellman · ISO 27001 Certified by schellman · Cybersecurity Maturity Model Certification · Better Buildings Challenge U.S. Department of Energy · FISMA

Key Infrastructure Considerations

Innovation Ecosystems: Partnering For Success

According to IDC, 75% of enterprises with over 1000 employees see a vendor's ecosystem of ISVs and managed services partners as one of their most important digital infrastructure and cloud services selection criteria. A thorough ecosystem analysis should always feature in the colocation selection process.

End-To-End Ecosystems (Travel)



As customer expectations rise, data levels increase and applications become more sophisticated and multi-functional, processing proximity matters more and more. Plug and play API-driven services can be tested and rolled out faster under one roof.

In-house colocation ecosystems have never been more important. New partnerships between businesses and their partners come to life with minimal latency via cross-connects in the Meet-Me Rooms of carrier-neutral cloud-rich data centers.

Connectivity, add-on specialist service and security layers and cloud connects make these new plays easy and cost-effective to replicate nationally or internationally. New app functionality can be boltedon almost instantly via a third party partner and an API.

Directly connecting to partners and providers within the same data center eliminates latency and increases efficiency, cutting a huge amount off network costs and accelerating connections to new services. Global interconnections and direct cloud connections support data transit and core flows.

Replication & Reach: The Moving Edge

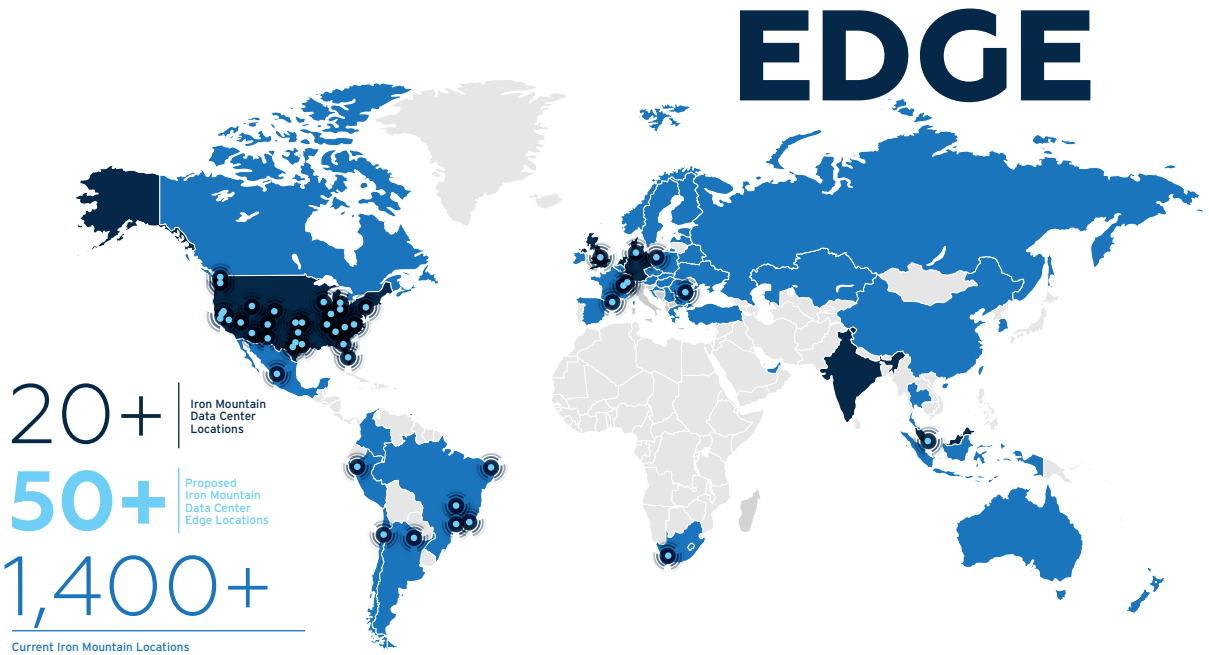
If you do choose a hybrid multi-cloud approach, key considerations are where to colocate and how to ensure easy expansion as next-generation consumer experiences take demands on your infrastructure to the next level.

The edge of Internet infrastructure is a moving target that is of increasing importance to new and next generation apps that require ultra-low-latency. To customers that are further out or in need of increasingly low levels of latency,firms are deploying smaller increments of cloud infrastructure in close proximity with 5G connectivity. These deployments can be as small as a few dozen racks and will live in edge colocation data centers, NSP aggregation points and other strategically placed locations.

Provider capability in location-sourcing, capacity and power planning must be up to providing timely space and operational support for core and partner servers and connections. For edge developments, expertise on the ground and access to space are critical in working with utilities, regulators, logistics, contractors and staff.

Building The Edge

Edge facilities are mushrooming and you will need space there at some point. There are a variety of edge build propositions. For instance, in addition to 20 core data centers in North America, EMEA and APAC, Iron Mountain has, over the past 70 years, built a portfolio of 1400+ facilities worldwide. 695 of these facilities are located close to city centers or airports in the sub-5ms zone – the Metro Edge. Spread across 50 countries, they provide a valuable source of potential Network Edge and Metro Edge PoPs for local zones. IMDC is rolling out a proprietary highly secure (US government Sensitive Compartmented Information Facility or SCIF) and customizable modular edge solution.



Key Infrastructure Considerations

Sustainability: The Road To Zero Carbon

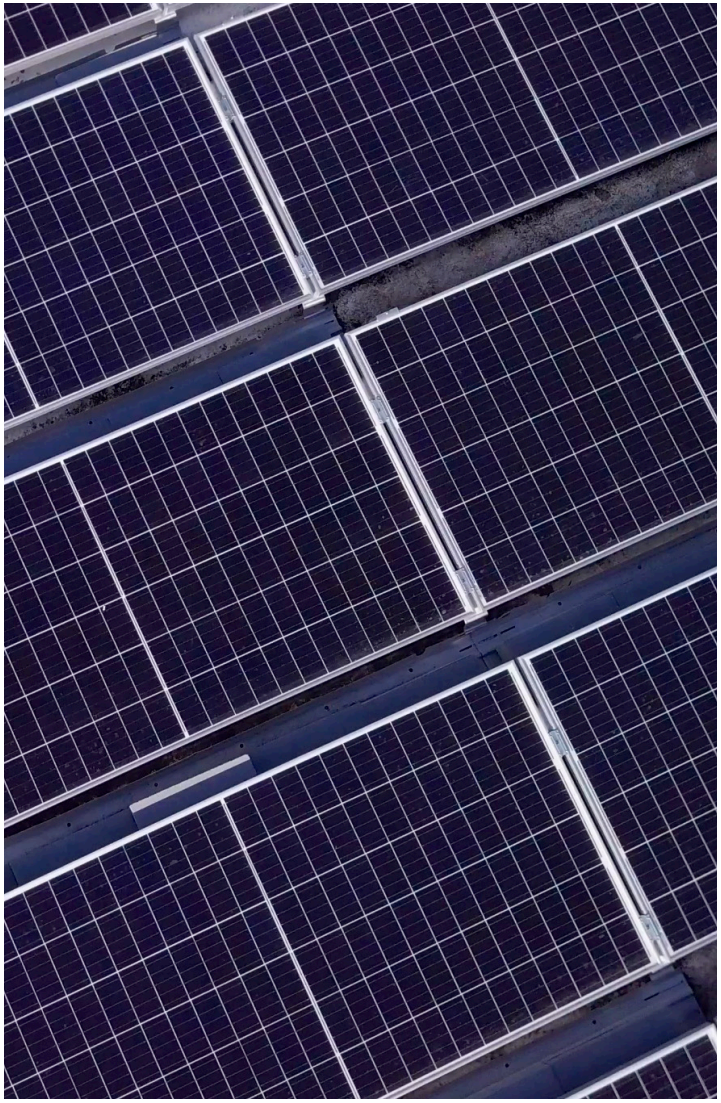
Trust is at the heart of the relationship between a business and its customers. Shared values ensure that relationships can stand the test of time. As data levels rise, sustainability has become critical to long-term value and should be integral to standards and supplier selection.

Efficient Power Usage Effectiveness (PUE) is the benchmark by which sustainability levels are improved. Demand ISO 50001 Energy Management and ISO 14001 Environmental Management certifications as they ensure year-on-year reductions in environmental impact. Insist that PUE figures are published annually.

Embodied impact should also be minimized during building, using voluntary certifications such as the BREEAM low-impact build standard. Also bear the impact of ICT equipment in mind when planning. For both efficiency and impact reduction, check that IT asset lifecycle optimization and recycling, remarketing and secure disposal are available.

Energy should be sourced or offset with renewable generation. Demand 100% renewables, any provider that cares about sustainability should be able to offer this by now. And go a step further if possible. Look for a carbon credit scheme like IMDC Green Power Pass which passes on credit for renewables which you can then share with customers.

Push harder for longer-term benefits. Full decarbonization is the ultimate goal and this should be built into/aligned with your plans. If the site is suitable, demand renewable generation as close as possible to the point of use. To supplement on-site generation, it should also soon be possible to match site by site electricity use with local clean power generation every hour of every day to achieve 24/7 clean power. This ambitious new approach, ioneered by Google, will in time replace the current year-by-year renewable Power Purchase Agreement model. IMDC is currently the only data center provider to have committed to this total decarbonization model.



Conclusion

Agile Architecture You Can Trust

You will need infrastructure which protects your core while connecting you to anything, anywhere. A hybrid colocation model split between core infrastructure and ecosystems and multiple clouds and NSPs will deliver this. Look for guaranteed security and standards, automated migration and smart hands, and ease and speed of physical and virtual cross-connection to an active ecosystem. You will also need to add edge reach at some point in the future for higher-bandwidth next-gen services.

From a cost perspective colocation also converts Capex to Opex, reduces TCO via competitive ecosystems and direct cloud connections, future-proofs infrastructure by handing off investment in space, power and connectivity, and frees up cash for business development.

Successful businesses understand the value of trust to brand development and customer loyalty. Climate change and data protection and sovereignty have come to the forefront of customer concerns, adding a new dimension to customer satisfaction that impacts IT infrastructure design.

As your processing infrastructure will account for an increasing portion of your energy and embodied material impact, you should also apply the strictest ESG principles when selecting a provider. In this new era of transparent collaboration and global scrutiny, reputation, openness (to change and to other vendors), and ethical leadership matter even more. This is a natural consequence of the increasingly dominant role of cloud infrastructure and application providers in the global economy.

Transformation provides a platform for overcoming the challenges of the past and rebuilding with a lighter footprint and a more ethical stance; rethinking the workplace, partnering in new ways, increasing efficiency, minimizing negative impact and capturing a new generation of customers.

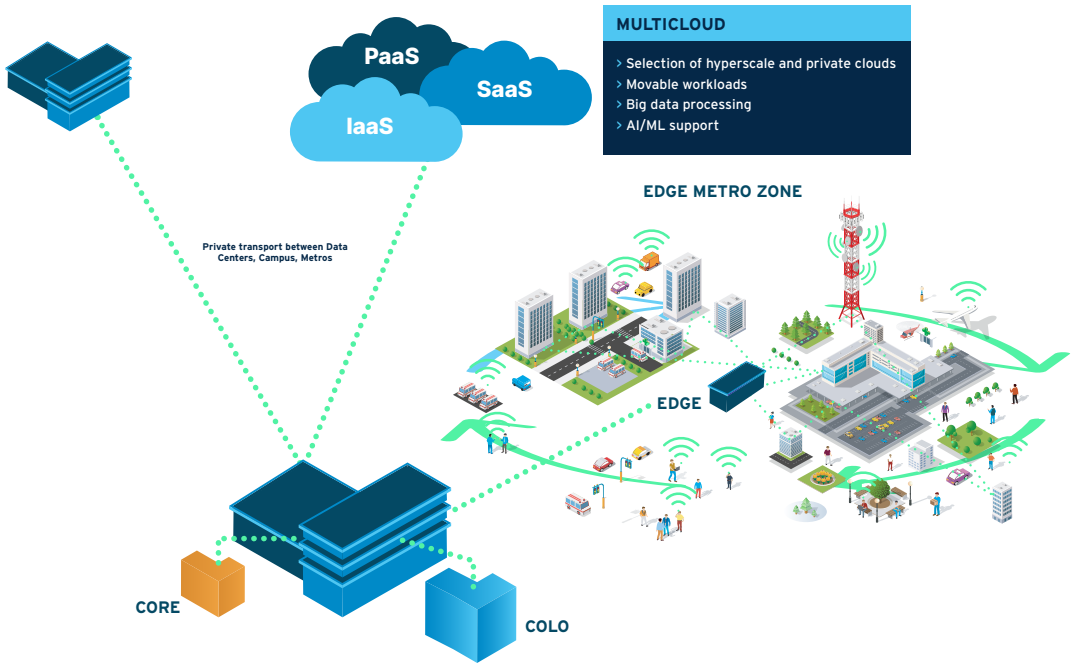
Conclusion

Trustworthy Transformation

A hybrid cloud-and-carrier-neutral colocation model provides a low-impact flexible space for developing and testing new services, with the agility to move workloads quickly in and out of clouds and reach new customers with low-latency edge services.

Features To Look For

- Hybrid cloud hosting
- Range of on-site network services
- Rich partner ecosystems
- Seamless edge access
- Replicable architecture for market expansion
- AI/ML access for big data services
- Redundant direct connects to multiple clouds
- Global data security and operational standards
- Incremental PUE improvements
- 24/7 renewable power



MULTICLOUD

- Selection of hyperscale and private clouds
- Movable workloads
- Big data processing
- AI/ML support

CORE DATA CENTER

- Legacy apps
- Archives
- Segregated data
- Core control hub

COLO ECOSYSTEM

- Fintech APIs
- Cloud connects
- AI/ML Uplinks
- Blockchain gateway
- API Interconnects
- Security layers
- Cross-sector DevOps
- NSPs/Carriers
- Virtual network services
- Internet Exchanges

EDGE FACILITIES

- 5G MVNOs
- Cloud local zones
- AR/VR
- IoT
- Ultra-low-latency apps

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Get in Touch

Iron Mountain Data Centers operates a global colocation platform that enables customers to build tailored, sustainable, carrier and cloud-neutral data solutions. As a proud part of Iron Mountain Inc., a world leader in the secure management of data and assets trusted by 95% of the Fortune 1000, we are uniquely positioned to protect, connect and activate high-value customer data. We lead the data center industry in highly regulated compliance, environmental sustainability, physical security and business continuity. We collaborate with our 1,300+ customers in order to build and support their long-term digital transformations across our global footprint, which spans three continents.
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