Solving IT Modernization Challenges with
HYBRID IT

CoreSite
An American Tower Company

In 2011, the U.S. government announced its "cloud-first" policy, formally called the Federal Cloud Computing Strategy, in order to consolidate services spread across about 2,000 data centers.[1] The overarching goal was to decrease spending on IT infrastructure, or as expressed in business vernacular, reduce "total cost of ownership" (TCO).

Cloud-first should not mean cloud-only.

"Cloud-first" also became a mantra for enterprises. However, during the next 10 years enterprises and government agencies have realized that cloud-first should not mean cloud-only; the actual benefits for cloud did not always meet expectations for agility and scalability, performance and interoperability, security and cost. In response, they started rethinking their hybrid IT environment.

Today, Gartner® says, "By 2025, 85% of infrastructure strategies will integrate on-premises, colocation, cloud and edge delivery options, compared with 20% in 2020."[2]

**2025**
85%
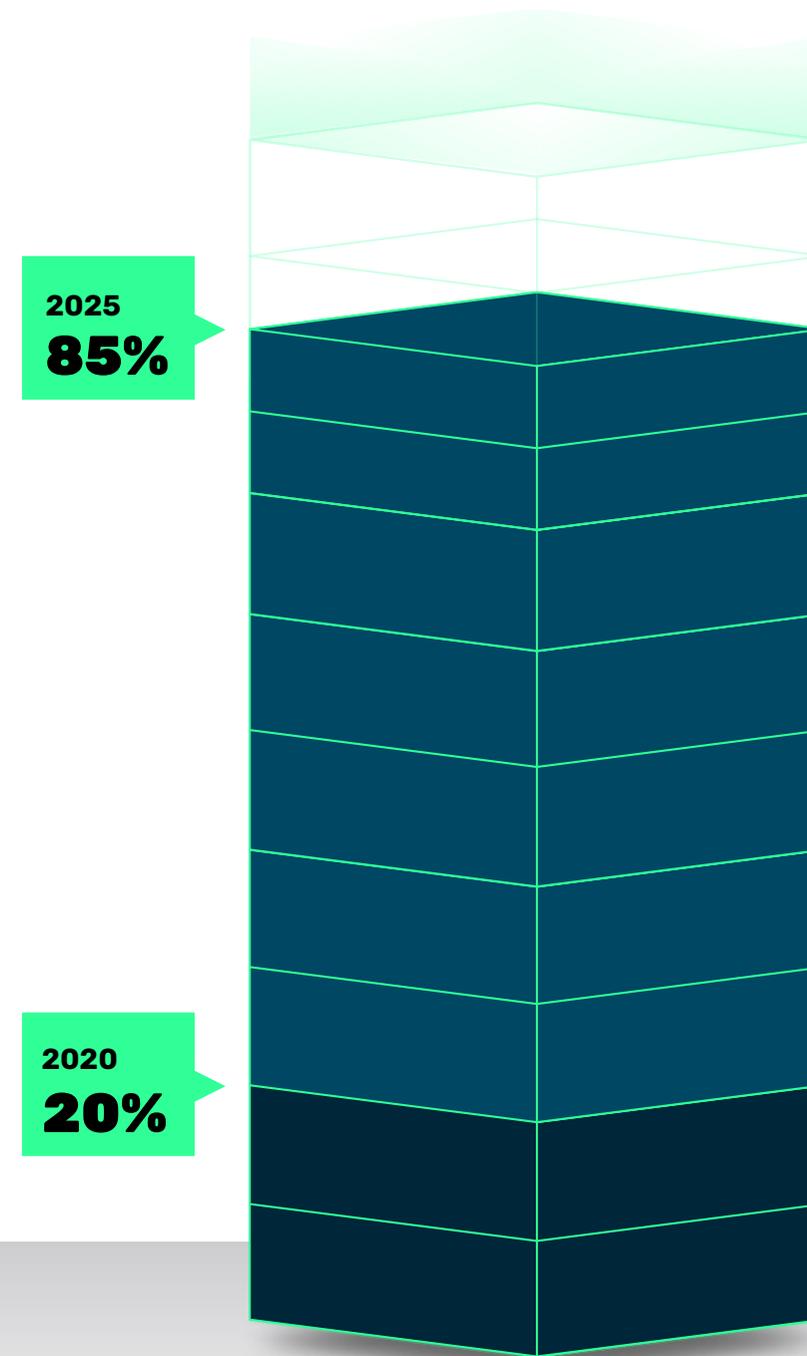
2020
20%

FIGURE 1: Hybrid Thinking is the Future in Infrastructure Strategies
based on Gartner, Inc., Your Data Center May Not Be Dead, but It's Morphing, David Cappuccio and Henrique Cecci, September 17, 2020.

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The Evolution to Multi-Cloud and Hybrid IT Deployments Brings New Challenges

- Determining enterprise data and workload/services applications and locations that yield the highest value and return on investment (ROI)

- Improving the ability to respond to rapidly shifting business conditions

- Adapting to the new "face" of the workforce: remote employees and those who opt for a hybrid work-from-home schedule

- Choosing what to focus on, finding the budget for it and the people to make it happen

- Implementing a multi-cloud deployment that proves the technical and financial business case without creating unnecessary risk

- Engaging the colocation, cloud and service providers best suited for the organization while retaining the ability to start and end those relationships as needed

The COVID Effect

No contemporary discussion of cloud can happen without including the impact of COVID-19. This global pandemic and subsequent economic and business disruption revealed that enterprises further along in their digital transformation journey were able to respond better than others. It also inspired "hybrid thinking," made imperative because global lock-downs forced people to rely on interconnection more than ever for work, entertainment and social interaction.

In this white paper, we will explore what is catalyzing hybrid IT evolution. We also will show how colocation fits into enabling an enterprise to build a multi-cloud or hybrid IT infrastructure that meets their operational requirements and aspirations, and will quickly adapt when challenges arise:

Why Hybrid IT Now?
The time is now for achieving business objectives with hybrid IT

Enabling Infrastructure Technologies
The "coming of age" of digital infrastructure, including digital ecosystems: "interconnected sets of services through which users fulfill a variety of cross-sectoral needs in one integrated experience"[3]

The Case for Colocation
Why colocation is an essential element in hybrid IT and solving the "wicked problems" enterprises face
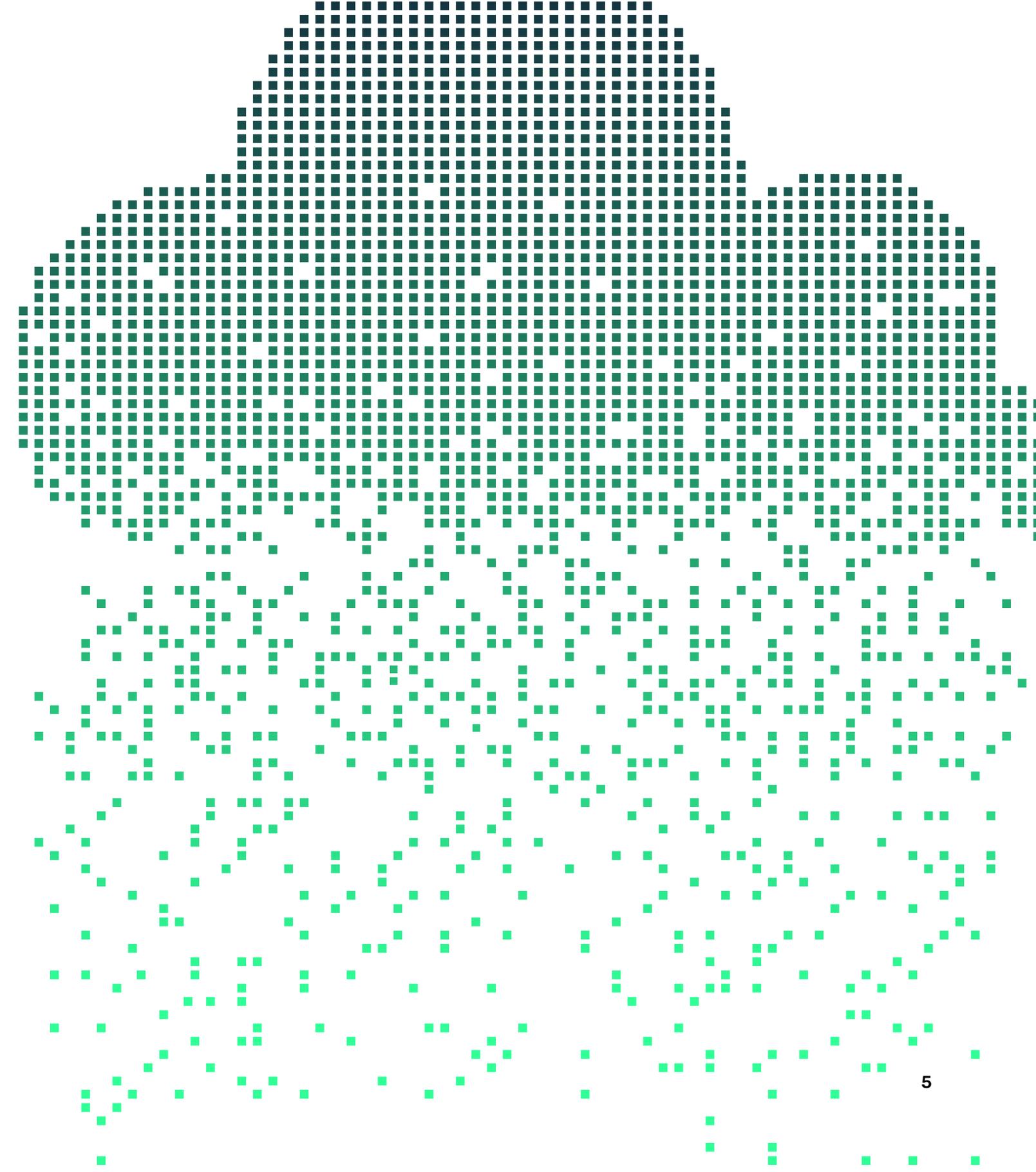
Why Hybrid IT Now?

There are many reasons to believe that the time is right for hybrid IT to fulfill the expectations that the cloud-first/cloud-only strategy failed to fully meet. Fundamentally, moving data out of on-premises data centers and into public cloud is a great idea; off-loading the pressure to support ever-increasing compute and storage needs eliminates the expenses of scaling onsite.

But digital enterprises have learned it is difficult to model or predict data usage volume. In 2020, data use increased beyond expectations due to remote working, online schooling and a spike in consumer media consumption, all driven by COVID-19. According to Statistica, the volume of data/information created, captured, copied and consumed worldwide jumped from five zettabytes (ZB) in 2011, to 41 ZB in 2019 and 64 ZB in 2020, a new high and higher than projected.[4]

What many enterprises can count on is a shift in operational strategy to support remote workers.

A Coronavirus Flash survey by 451 Research in the first half of 2020 found that 67 percent of companies expected to make the work-from-home policies enacted in response to the pandemic to be permanent.[5]

THE NEW WORK-FROM-HOME PARADIGM

80%
Work from home currently in place

67%
Expect to remain long-term or permanently
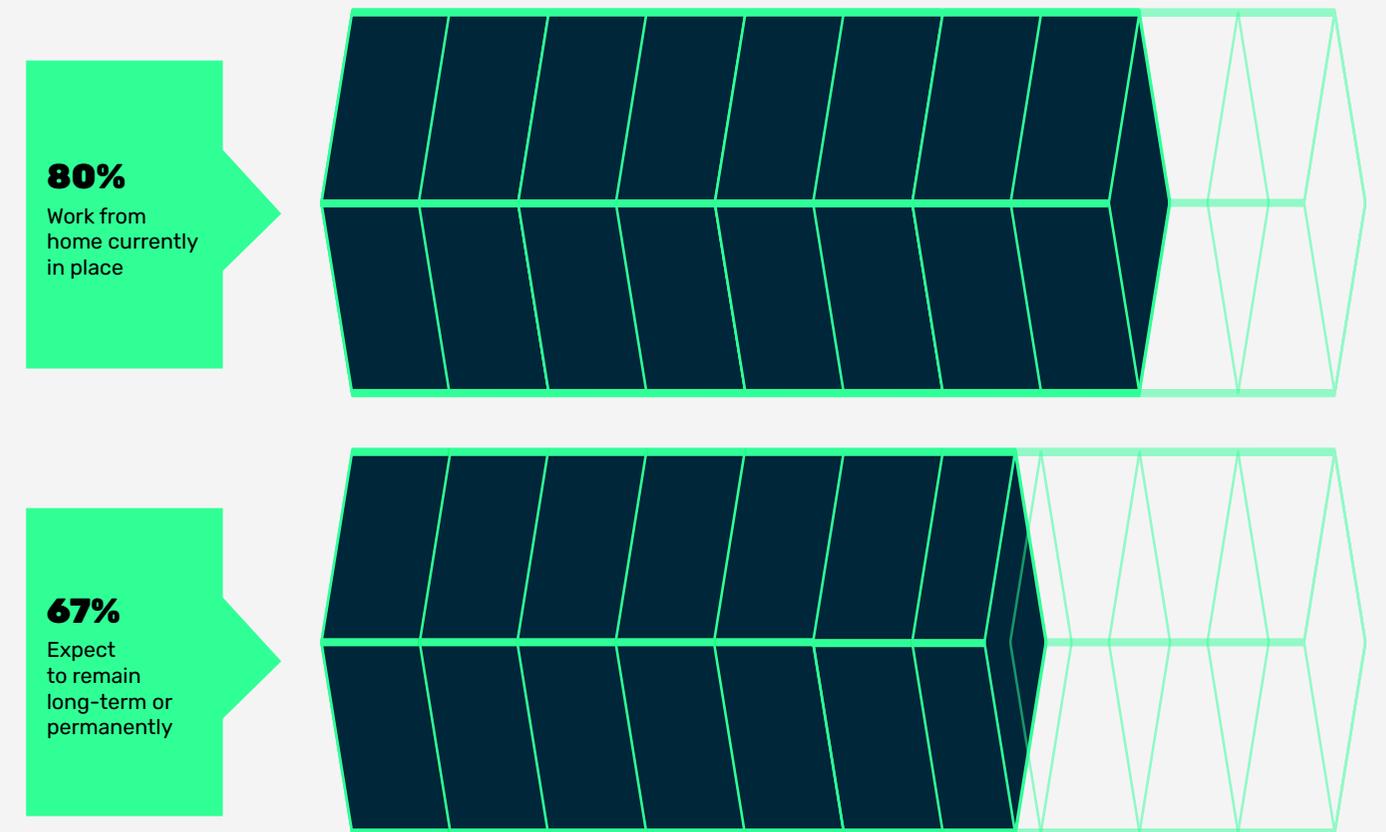
FIGURE 2: Coronavirus Flash Survey.[5]

How Operational Shift Can Change the Business Model

Data transfer charges apply based on the source, destination and amount of traffic. While it is free to move data into public clouds, egress fees incurred when data is moved out can lead to surprising monthly charges. And, it is easy for many organizations to reach 100+ terabyte data transfer activity through public clouds on a monthly basis.

A hybrid IT infrastructure can control data egress fees by enabling an enterprise to distribute data to on-premises data centers and colocation facilities – at lower cost for storage and bandwidth. Also, the opportunity to leverage a direct native connection between a data center and public cloud provider (such as AWS, Google Cloud, Azure, Oracle, Alibaba, etc.) can create significant network usage savings; cloud connectivity through native on-ramps is 60 percent less expensive than traditional telco and software-defined networking (SDN) offerings.*

Hybrid IT reduces the need to fund hardware upgrades and buy/maintain software, allowing IT to shift spending priorities. The IDG 2021 State of the Data Center survey of 300 IT executives found that companies are gravitating to an operating expense (OpEx) model for about half of their IT spend (46 percent).[6] Making the decision to change a business model includes weighing costs against risks. Knowing what the costs are is an advantage of a CapEx approach for companies; however, there are trade-offs, including:

- **Buying capacity you do not need now in anticipation of future uncertainties – and being forced to hang on to the assets**

- **Restricted agility, ranging from difficult scalability to third-party vendor lock-in**

- **Architecting an environment that is not future-proof**

Furthermore, capital and personnel resources are finite. Moving workloads to third-parties frees employees to focus on improving core business processes, competencies and innovation – and allows dedicating personnel and budget to projects that support business differentiators.

Ecosystem 2.0: Interconnecting the Digital Community

When consumers and business partners were forced to look for goods and services on the internet more than ever, the business case for being part of ecosystems – which includes elevated core business efficiencies, better user experience and expanded market reach – proved to be justified.

Data centers serve as the hub for companies to build an encompassing digital customer experience, leveraging the provider's exchange platform to connect to clouds and services. Accelerated digital transformation compelled parallel evolution of digital ecosystems, sets of relevant, interconnected services.

The CoreSite Open Cloud Exchange® (OCX) is one such platform. Through the OCX, CoreSite colocation customers can take advantage of enterprise-class connectivity services to simplify and accelerate building private networks, facilitating site-to-site interconnection (among business partners) and access to an ecosystem of providers offering services that businesses need to thrive in today's digital economy.

The CoreSite Open Cloud Exchange®
Enterprise-class connectivity services to:

Public cloud services

Private cloud services

Networking and telecom-relevant services (IaaS)

SaaS

Monitoring and security

System integrators

McKinsey estimates that at least a dozen sectors, including B2B services, mobility, travel and hospitality, health, and housing, are reinventing themselves as vast ecosystems.[3]

The financial industry is a good B2C example of "ecosystem 2.0" transformation. Banking customers have come to expect a fully online experience for even complex transactions such as car loans. And, they are open to connecting with investment advisors and other related services, which in the past required establishing separate relationships.

Smart logistics in supply chains is one example of digital transformation in a B2B vertical market. Connecting automated warehousing, cargo tracking and remote fleet management streamline workflows for all stakeholders, setting them up for "synergistic co-creation of value, where savings and opportunities are generated and shared between business partner organizations, resulting in "win/win/win" relationships."[7]

The benefits of exchange ecosystems are not limited to enterprises. Gartner Research posits that, "by 2023, 70% of net new cloud-related technology service provider opportunities will be driven by participation in hyperscale cloud provider partner ecosystems, up from 30% in 2020."[8]

Ultimately, controlling costs for hardware and personnel, reducing network usage fees (while also improving security with private networks) and the services available from digital ecosystems help enterprises achieve business objectives – reduced TCO, business agility, improved security and growth – by expanding market reach.

Enabling Infrastructure Technologies

Successfully moving from a cloud-first to a multi-cloud, or hybrid IT approach, requires also rethinking how to utilize the enabling technologies. Each enterprise is unique. Therefore, it is essential to determine the optimal application distribution, and then architect a network customized for the business.

Rethinking, not necessarily repatriating

A 2020 Harvard Business Review Services Survey of 260 readers (49 percent with 10,000 or more employees; 12 percent with 5,000 – 9,999 employees) showed that 50 percent opt to replace legacy applications with cloud-native versions, 42 percent move applications to the cloud (modified for interoperability) and 37 percent "lift-and-shift" apps to a new cloud location.[9]

Where to locate (or relocate) applications is paramount to realizing the agility, cost, performance, availability, security and compliance requirements that did not happen as the cloud-first strategy played out. As IDG observes, there are five options available, seen in Figure 3.

A VARIETY OF PATHS TO CLOUD

50% **Replacing:** retiring a legacy application and replacing it with a new cloud-native application

42% **Replatforming:** moving applications to the cloud with limited changes e.g., modifying the way the application interacts with the database or adding features to better enable scaling)

37% **Rehosting:** "lifting and shifting" applications to cloud infrastructure as is

26% **Rebuilding:** rewriting the application from scratch to take advantage of cloud-specific models such as application containerization or serverless computing

17% **Refactoring:** rearchitecting the internal cold of the application to break it down into modular components in order to better take advantage of cloud features

FIGURE 3: Options for application location.[9]

With close reading, you will notice that we say "rethinking, not necessarily repatriating." Here's why. Enterprises are facing a dilemma today. On one hand, repatriation can yield economic advantages. An often referenced VentureBeat article, *The cost of cloud, a trillion dollar paradox*, includes: "Repatriation results in one-third to one-half the cost of running equivalent workloads in the cloud."[10] On the other hand, according to 451 Research, "The COVID-19 outbreak certainly hasn't validated the repatriation hypothesis – 19 percent of enterprises have accelerated public cloud migration, while just two percent are moving away from public clouds."[11]

THE IT INFRASTRUCTURE MIX: WHAT ENTERPRISES DEPLOY TO MEET BUSINESS NEEDS
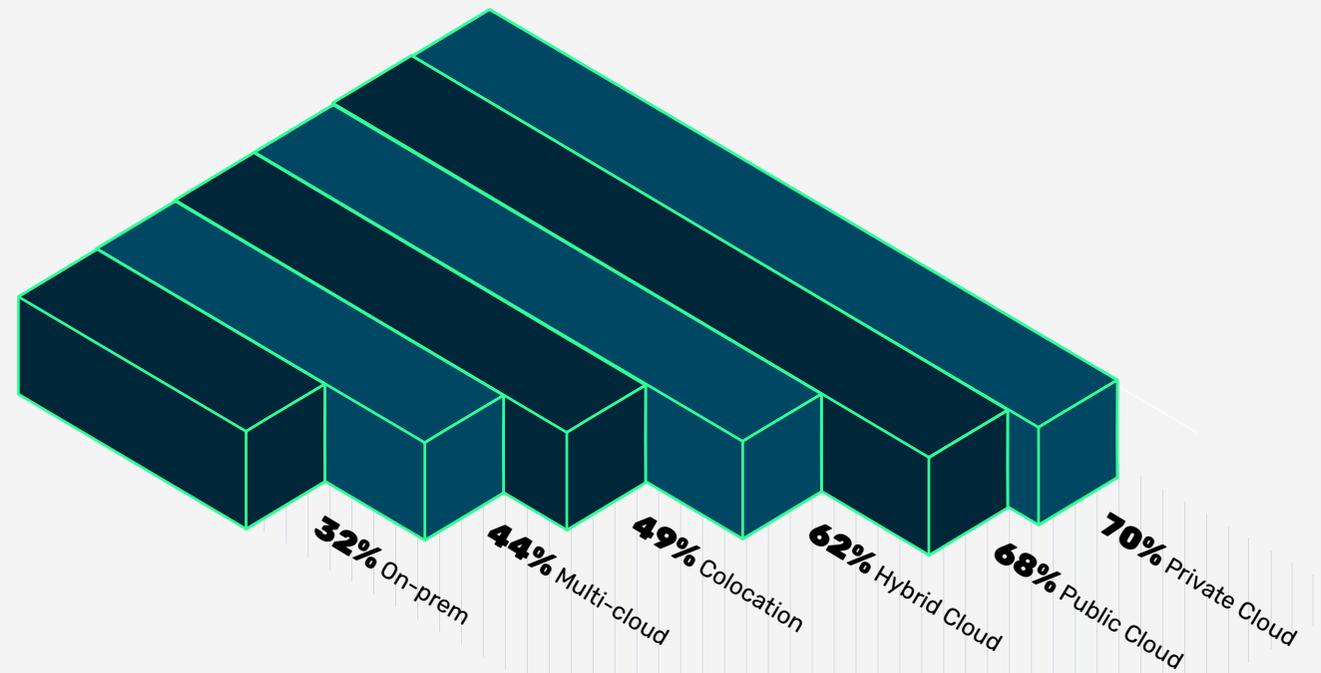

FIGURE 4: Infrastructure mix: what today's organizations are using.[6]

The importance (or not) of latency

The best place for an application to live depends on the use case; at first blush, that is a rudimentary statement, but it leads to a more involved discussion around latency, the Internet of Things (IoT), edge and 5G.

Overall transmission infrastructure performance, affected by connectivity, servers, the task and distance, has reached incredible speeds. Today's top-speed mobile network, 5G, enables delivering up to 20 Gigabits-per-second (Gbps) peak data rates and 100+ Megabits-per-second (Mbps) average data rates.[12] That speed is critical when it comes to machine-to-machine communication; IoT use cases depend on as close to real-time (near-time) data exchange as possible.

However, is it necessary for an email application, reporting tool or even video chat (which average 1.2 Mbps upload/download[13]) to be as low-latency? There is an argument to be made that milliseconds

of time can add up to noticeable productivity differences for people, but in terms of the user experience and overall employee efficiency, does the cost of enabling the performance justify an imperceptible difference?

That is the nature of evaluations each enterprise needs to make for each application, in the context of their current and foreseeable needs, when determining workload distribution. To add color to the discussion, consider this observation from IDG: "Having colocation as part of the hybrid infrastructure enables enterprises to concentrate high value workloads such as artificial intelligence (AI), machine learning (ML), customer relationship management (CRM) and mobile apps in their own data centers while pivoting other types of workloads to colocation to optimize IT expertise and computing resources."[6]

Evaluating public cloud benefits is another part of the decision process related to the latency

a business requires. 451 Research crystalizes the rationale by saying: "The whole point of the cloud is to enable rapid scalability, to allow organizations to grow and shrink applications to changing demands with no notification, paying only for the resources consumed. This allows businesses to grow capacity when needed so opportunities aren't missed, to quickly enter new markets, to change business models and launch new products, and to take risks and experiment. This ability was never so important as it was during the COVID-19 pandemic."[11]

The degree of edge computing an organization requires also drives deployment decisions. Again, the choice depends on latency requirements for the task at hand, which is leading us to discussion of another enabling technology – networks.
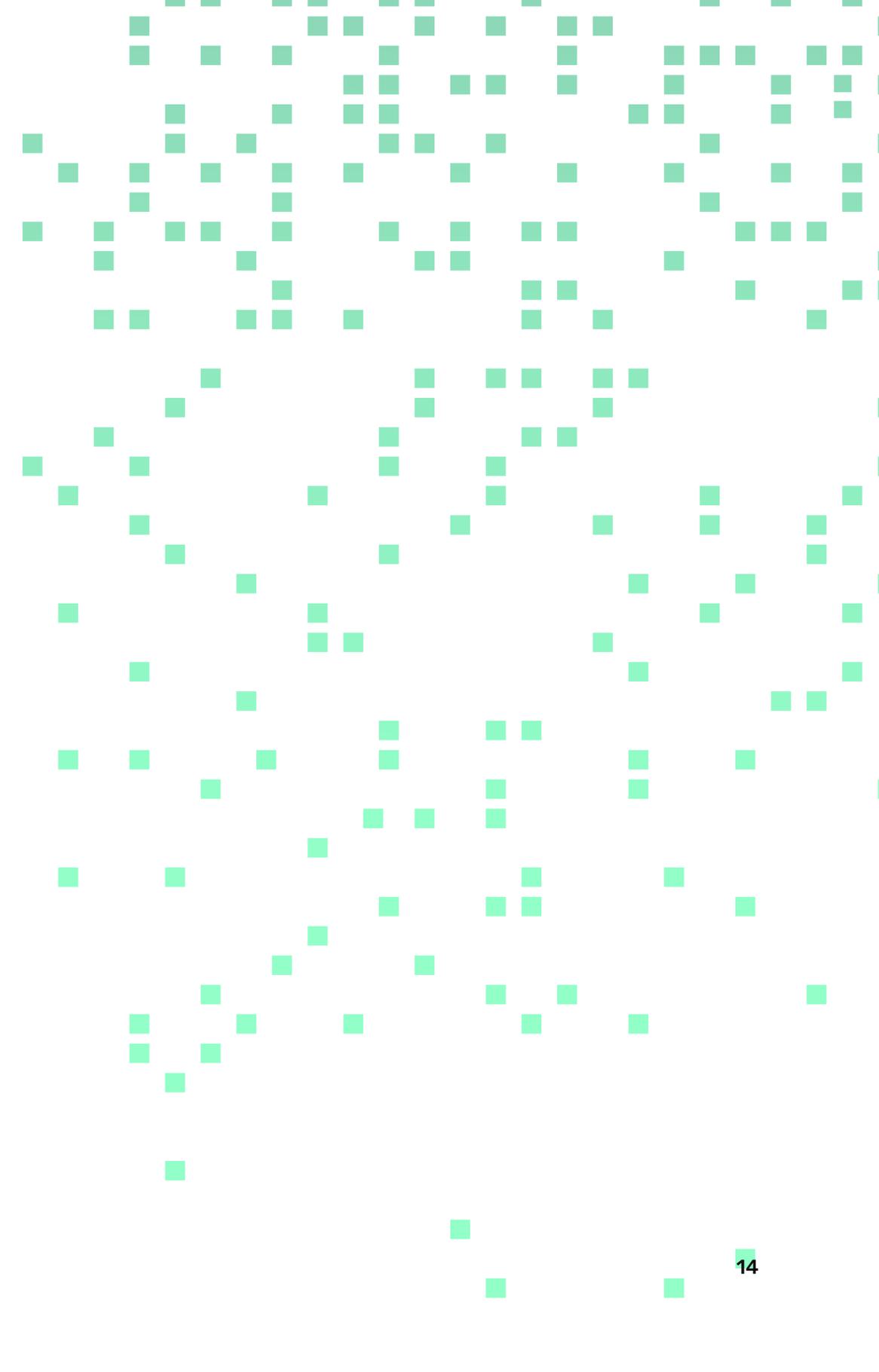
Networks tie it all together

Enterprises are redesigning their networks from their own data centers all the way to the edge to support their new initiatives for multi-cloud adoption and application distribution. Ten years ago, the public internet was the obvious choice for connecting to public cloud and reaching edge locations. Today, colocation data centers can be the nexus of hybrid IT interconnection. A multitenant, densely networked data center can offer direct connection to public cloud service providers (CSPs) as well as interconnection to private clouds, digital ecosystems and network service providers. Direct, native connectivity to CSPs is an important part of a forward-looking network architecture. In addition to the cost savings discussed earlier, native "on-ramps" provide a private, highly reliable gateway to CSPs over a layer 2 Ethernet fiber connection.

With physical cross connects complemented by virtualized network management, enterprise IT teams can more easily achieve optimal agility, performance and reliability than they can leveraging the public internet and a hub and spoke network topology.

Software programmable interconnection, which one might consider to be next-gen SDN, adds another element in the hybrid IT formula. It is illustrative of hybrid IT in general, in that IT teams can take advantage of virtualization to further accelerate connectivity, scalability and workload management.

Software programmable interconnection also simplifies implementing on-net, direct connection to enable the security, performance and reliability required to support modern digital infrastructures, especially for highly regulated industries such as healthcare and financial services, as well as public sector entities required to meet stringent government compliance mandates.

The Case for Colocation

In Figure 4, you saw that colocation accounted for 49 percent of the infrastructure mix for the IT leaders IDG surveyed in their annual State of the Data Center Report. When asked why colocation is part of that mix, respondents said:

35% – Lowering total cost of ownership

38% – Garnering efficiencies in hardware and virtual environment to achieve optimal performance

52% – Improving the stability, redundancy and uptime of infrastructure
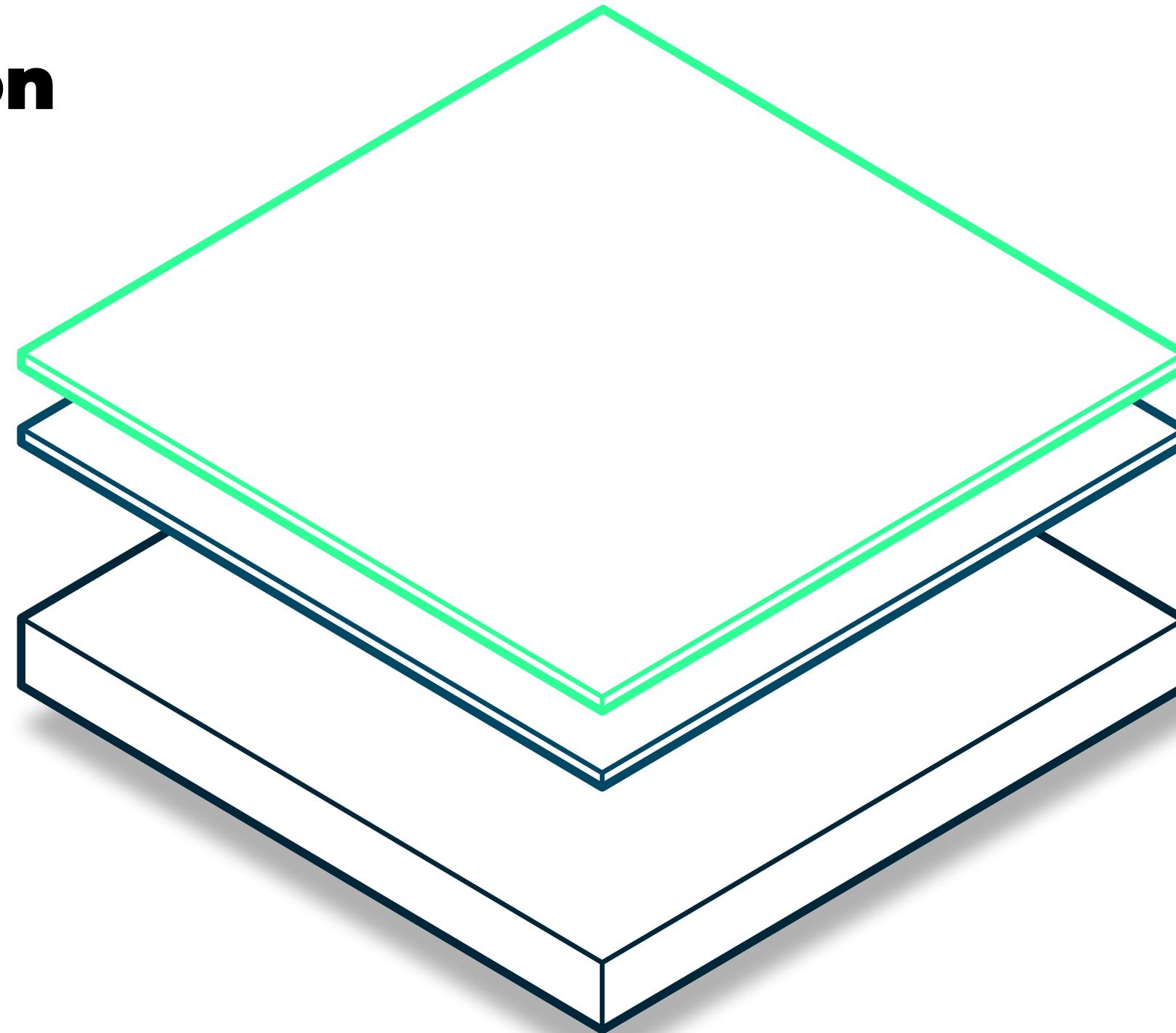
There are myriad other business drivers supporting the case for colocation, ranging from increased security to reduced workload on the technical staff, and offloading the burden of assuring business continuity to a partner who has the skills and hardware to guarantee 100 percent uptime, as seen in Figure 5.

Compliance can also determine location. An enterprise may choose to keep data on-premises to meet industry regulations, although colocation typically enables addressing PII (personal identifiable information), Health Insurance Portability and Accountability Act (HIPAA) and even data sovereignty requirements.

While all compelling reasons, not every workload belongs in neither colocation nor public cloud. Business applications, for example CRM or ERM (enterprise relationship management) software, as well as research and development tools utilizing intellectual property, can be deemed "mission-critical" and best kept on-premises.


51%	48%	46%	39%	38%	36%	34%	34%	34%	29%	24%
Increased security	Increased flexibility/ stability	Increase stability and uptime of infrastructure with less maintenance	Better functionality at the same cost	Efficiencies in hardware and virtual environments for steady state level	Reduced workload on technical staff	Provider's ecosystem of partners provide additional management, security and other services	Provider maintains networking/ interconnect services to a wide range of cloud and other service providers	Built-in disaster recovery/ redundancy without managing it	Ability to create self-service	Avoid reinventing the wheel

FIGURE 5: The Key Business Advantages Driving Enterprises to Choose Colocation
Key drivers for moving to colocation.[6]

Colocation and security

Security is, and always will be, top-of-mind. Colocation providers can fortify facilities with trained security personnel plus layers of access protection such as man-traps, perimeter fencing and biometric screening – physical security most enterprises cannot match. Colocation providers bolster cybersecurity with advanced endpoint protection, offline backups, least privileges, network segregation and threat monitoring. If an exchange is offered, colocation customers may have the option to integrate cybersecurity services from third-parties as another layer in a defense-in-depth strategy.

Colocation and business assurance

Colocation's strengths include elevated business assurance (disaster recovery/ business continuity) in several ways. One can look to purpose-built qualities, starting with the facilities designed to withstand Mother Nature's most stringent environmental tests, as well as redundant power, cooling and on-site technicians ready to take action 24x7x365. Furthermore, colocation can eliminate power, cooling and interconnection single-point-of-failure issues, while interconnected campuses provide redundant data storage and diverse network selection.

Why Colocation Is an Essential Part of the Hybrid IT Mix

Enterprise digital business requirements are constantly evolving. Colocation plays a pivotal role within the hybrid IT infrastructure, providing the interconnection, security, resiliency, flexibility and scalability enterprises need to meet business objectives.

Gartner defines hybrid thinking as: "An organic discipline for taking on wicked problems by iteratively implementing transformative, innovative, and strategic change via the co-creative exploration of human-centered experiences that are culturally meaningful, technically feasible, and economically sustainable."[14]

Charting the path to a future-proof digital business is complex. Most enterprises simply cannot do it alone. Steve Smith, chief revenue officer for CoreSite, frames up the company's approach to the hybrid IT mix: "For enterprises to leverage technology to the best of its possibilities, it's not just about looking at where hardware or software sits, it's about how they manage the collective IT infrastructure as an integrated set of resources. It's about establishing the most effective way to do that from a performance, cost and security perspective, and layering in stacks of various IT resources where they need to be."

Colocation is an essential part of solving the wicked hybrid IT problems enterprises face. Think of it this way: a colocation provider is a digital supply chain optimization expert.

Data is the product; servers, software and networks are the delivery mechanism. Data centers sit within the digital supply chain, with colocation providing workload management at the intersection of all of the dynamic, interconnecting branches tied to the enterprise and its digital community. Together, colocation services and hybrid IT technologies form an ideal environment for strategic change, enabling enterprises to future-proof their digital business.
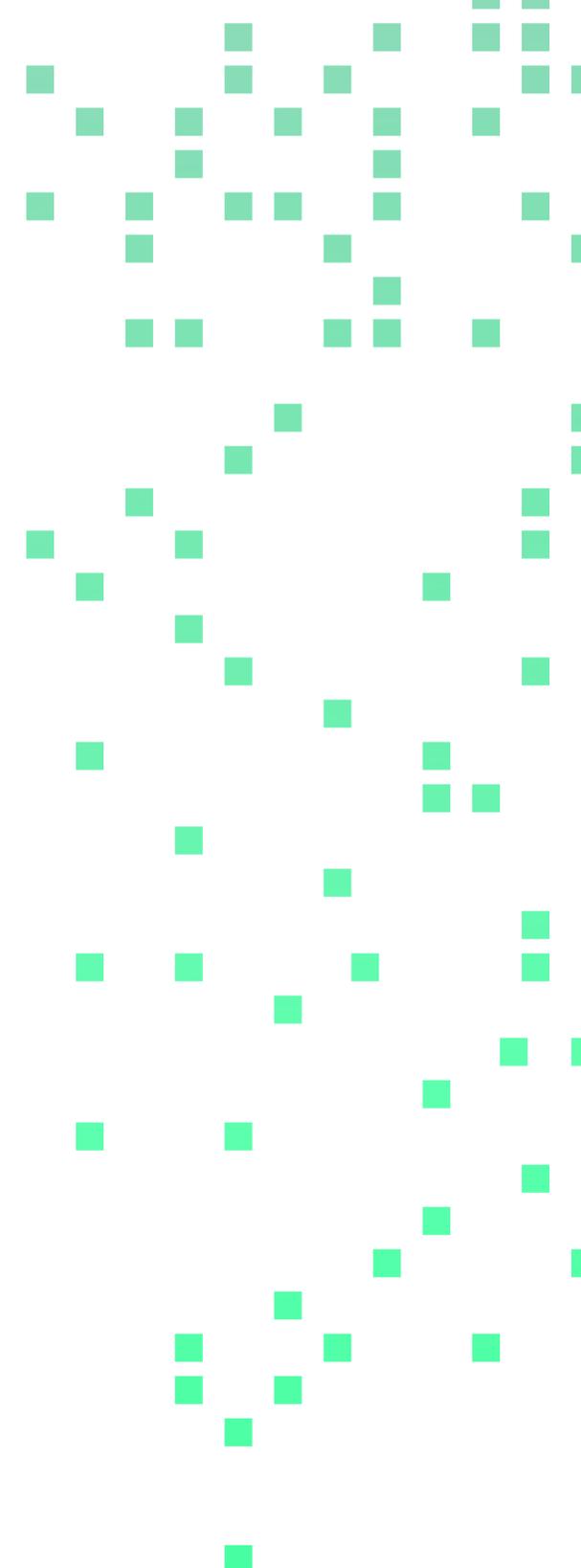
Hybrid thinking

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SOURCES AND NOTES

1. U.S. Government To Take 'Cloud-First' Approach To IT, CRN

2. Gartner, "Your Data Center May Not Be Dead, but It's Morphing," David Cappuccio and Henrique Cecci, September 17, 2020

3. Ecosystem 2.0: Climbing to the next level, McKinsey Digital

4. Volume of data/information created, captured, copied, and consumed worldwide from 2010 to 2025 (in zettabytes), Statista

5. COVID-19: Secure remote access services in demand as enterprises continue work-from-home strategies, 451 Research®

6. 2021 State of the Data Center Report: Colocation is the Nexus for Hybrid and Multi-Cloud IT Driven Business Success, IDG/CoreSite

7. Supply Chain 4.0: 6 Ways Digital Transformation is Transforming the Supply Chain

8. Gartner, "Market Trends: What You Must Know When Partnering With Public Cloud Service Providers", Mike Dorosh, Ed Anderson, Brandon Medford and Craig Lowery, January 24, 2021

9. The State of Cloud-Driven Transformation, Keys to Accelerating and Capitalizing on Cloud Adoption, *Harvard Business Review*, Analytic Services

10. The cost of cloud, a trillion dollar paradox, *VentureBeat*

11. Can private clouds ever really compete with the public cloud?, 451 Research®

12. Everything you need to know about 5G, Quaalcom

13. How Much Bandwidth Does Video Calling Use?, Maketecheasier

14. Gartner IT Glossary, "Hybrid Thinking," 24 September 2021. [https://www.gartner.com/en/information-technology/glossary/hybrid-thinking].

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About the Author

Aleks Krusko
Senior Vice President of Information Technology and Digitization

Aleks Krusko is responsible for the execution of CoreSite's digital strategies through technology, automation and business transformation. She leads the IT Solutions Delivery and IT Operations teams, including: software development, system support, information security and business intelligence. Aleks joined CoreSite in 2008. Before her current role, Aleks spearheaded the delivery of system and process efficiencies, change management and architected cross-functional solutions across the organization. Prior to joining CoreSite, Aleks held various roles of increasing responsibility in the real estate industry. She earned a B.S. in Chemistry, with honors, from Regis University.