

IDC TECHNOLOGY SPOTLIGHT

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This IDC Technology Spotlight identifies five key trends shaping the future of digital infrastructure that enterprises should focus on throughout 2021.

Key Trends Driving Enterprises Toward the Future of Digital Infrastructure in 2021

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Written by: Andrew Smith, Research Manager, Cloud Infrastructure Services

Modern Enterprises Are Embracing the Future of Digital Infrastructure

By 2022, 46% of an enterprise's products and services will be digital or digitally delivered, increasing the business' reliance on infrastructure (compute, storage, networking) to support more than traditional business applications. Timely access to innovative infrastructure resources — both shared and dedicated — will be imperative to sustain the adaptive, resilient, secure, and compliant digital business models of the future. This means enterprises will rely more and more on access to resilient and trusted infrastructure at the physical and logical levels, regardless of operational location (e.g., core datacenter, cloud, or edge). As organizations transition to digital infrastructure solutions, IDC makes the following predictions about their future business decisions:

» By the end of 2021, 80% of enterprises will put a mechanism in place to shift to cloud-centric digital infrastructure, twice as fast as before the pandemic.

AT A GLANCE

WHAT'S IMPORTANT:

Five major trends are shaping the future of digital infrastructure:

- » Exponential data growth pressures IT organizations to do "more with less."
- » Enterprise data is distributed beyond the datacenter.
- » Today's hybrid cloud reality impacts cloud data repatriation.
- » The adoption of composable, softwaredefined infrastructure is growing.
- » Organizations will continue to automate as much of their infrastructure processes as possible.
- » By 2023, an emerging digital infrastructure ecosystem will be the underlying platform for all IT and business automation initiatives anywhere and everywhere.
- » By 2024, 80% of enterprises will overhaul relationships with infrastructure providers to better execute their digital strategy, seeking ubiquitous deployment of resources and more autonomous IT operations.

For these predictions to come to fruition, a significant amount of change is still required within enterprise infrastructure ecosystems. This IDC Technology Spotlight examines five key trends that enterprises should be focused on throughout 2021 to accommodate and serve customer needs (both external and internal).

Trend 1: Exponential Data Growth Pressures IT Organizations to Do "More with Less"

Enterprises have indicated to IDC that they expect their stored data to grow an average of 30% annually. Using this growth rate as a general guide, we can assume that an organization managing 10PB of data today will store upwards of 13PB of data the following year. The challenge with this data growth trajectory is that spending on IT infrastructure is expected to grow only in the single digits and may even remain flat for many enterprises. This juxtaposition — data growth significantly outpacing IT infrastructure spend — puts many organizations in a precarious position. How can enterprises effectively store and protect growing volumes of data without adequate resources? Increasingly, they must strike a balance between the promise of generating value from data and the reality of running their business applications cost effectively and securely. In the scramble to keep up with data growth and monetization of enterprise data, organizations cannot lose sight of the fact that their data must be accessible and secure.

What It Means for the Future of Digital Infrastructure

» IDC expects enterprises to evaluate infrastructure solutions based on their ability to do "more for less," creating additional value through investments that are "bite size" and achievable.

For example, many enterprises are already ramping up their adoption of cloud-based cold storage solutions and services to tier data to locations that allow retention at the lowest cost possible. Cold storage services can ensure long-term access to the data — albeit at slower rates — in the event it is deemed valuable or necessary for digital initiatives.

- Similarly, we expect that the digital infrastructure initiatives of many enterprises will include a reevaluation of their storage workloads on a continuum of "hot" to "cold" in terms of their data access and application latency requirements. Organizations should match workload performance with the right performance tier of storage and consider solutions that can automate the placement of infrequently accessed data to the most cost-effective storage tier.
- Enterprises will look for infrastructure platforms that enable agile and consistent scaling of capacity (primarily compute and storage), utilizing on-demand, workload-specific components. Such platforms will help enterprises ensure they are using their resources effectively and, in the case of a services offering, paying for only the infrastructure resources they utilize.



Trend 2: Enterprise Data Is Distributed Beyond the Datacenter

Digital services increasingly reside in diverse clouds and new network/business edge locations, not just in core enterprise datacenters. IDC believes that overall, the "edge" represents a new frontier in the convergence of infrastructure domains such as compute, storage, and networking (more specifically, moving compute to where the data is created), which will give organizations the opportunity to dramatically reduce time to value. The edge is not a singular entity, nor is it the name of a singular market; rather, it is a way of recasting infrastructure boundaries beyond the datacenter depending on the use case, industry, or business function. According to IDC's *Worldwide Edge Infrastructure Software Forecast, 2020–2024,* which includes edge compute, storage, and related automation/configuration software, the market for these solutions is forecast to grow at a 2019–2024 compound annual growth rate of 11.5%, reaching \$5 billion in 2024.

Moreover, the ability to consume/manage resources in the optimal location based on latency, availability, and compliance characteristics is critical. Challenges such as data sovereignty, IT service at the edge, and reducing connectivity costs can be simplified and overcome when infrastructure can be placed/consumed anywhere.

What It Means for the Future of Digital Infrastructure

- The shift toward edge solutions and services will require technologies and operational processes that enable coordinated placement and use of applications across locations, making it possible for enterprise IT to be more agile and less location constrained. As a result, enterprises will look to adopt solutions that improve ease of application mobility across different locations, usage models, and cloud platforms.
- Most early adopters of edge technologies must be prepared to rely on highly custom deployments. Nowhere is the need for customization more evident than in the case of compute, where even a slight modification in the compute stack can alter the entire makeup of a system or a platform.
- As more companies embrace edge as part of their digital infrastructure strategy, they will need to define the requirements of their individual use case. These use cases might include solutions for Internet of Things (IoT) devices on a manufacturing floor or local image or video processing based on artificial intelligence (AI). Unlike the core and cloud, edge architecture can be heavily use case centric, and we expect organizations undertaking edge initiatives to rely on support from third-party partners that specialize in use cases by application (e.g., CRM, databases), industry vertical, or even geographic region to develop a strategy and deploy effective solutions.



Trend 3: Today's Hybrid Cloud Reality Impacts Cloud Data Repatriation

Workloads and data migrated to public cloud infrastructure do not always reside there permanently. Many workloads can fluctuate between deployment locations until they reach a state of equilibrium. A recent IDC survey shows that about 50% of enterprise applications are expected to stay in place over the next year. Additional research conducted by IDC as part of our annual *laaSView Survey* indicates that hybrid cloud is the de facto infrastructure standard for many organizations. Indeed, 55% of respondents indicated they currently operate in a hybrid cloud environment and use the framework for deploying applications in their optimal location/environment. This adoption of hybrid cloud environments (as opposed to purely on premises or purely public cloud) is indicative of the need for flexibility within enterprise infrastructure environments as applications and resources are shifted to the most optimal location depending on performance, cost, or security requirements.

What It Means for the Future of Digital Infrastructure

- Enterprise proclivity toward hybrid cloud environments should be seen as evidence that many organizations are taking a multiphase, workload-centric approach to application placement as opposed to an "all in" strategy that favors a single deployment environment regardless of the workload type.
- » Workload and cloud data repatriation happens; however, it should be seen as an exception rather than the norm. We believe it is more likely that applications will continue to take advantage of mobility (regardless of destination), and enabling that mobility is a critical element of success, rather than trying to determine the ultimate "destination."
- When designing or modernizing your infrastructure environment, assume applications will never remain static. Digital transformation and modernization, combined with unforeseen events such as COVID-19 during 2020, will drive application churn within enterprises as IT budgets change and workforces adjust to a "new normal," which in many cases means a higher prevalence of remote work and remote access to work systems/tools.

Trend 4: The Adoption of Composable, Software-Defined Infrastructure Is Growing

Composable, software-defined infrastructure is a set of not just technologies but also operating principles that align with and enable the future of digital infrastructure. Enterprises are looking to technologies such as function offload coprocessors (FOCPs, also referred to as SmartNICs) to create disaggregated, tamperproof infrastructure in which certain operator-defined capabilities (such as data persistence, security, and networking) are off-limits to the infrastructure administrator. These types of distributed computing platforms are just starting to gain traction in enterprises. While true hardware disaggregation is still in the future, FOCP-based platforms are already being used to spearhead a new generation of software-defined infrastructure composability that can better mitigate the risks associated with putting too much control onto a single processor.



What It Means for the Future of Digital Infrastructure

- IDC expects services providers and enterprises building their own software-defined infrastructure to utilize FOCP-based platforms to make it secure, tamperproof, and highly scalable. They will be able to offload not just embedded (kernel-level) functions but also, eventually, management functions onto these FOCPs.
- The biggest opportunity for IT buyers lies in discarding comforting notions about "tried and trusted" approaches to infrastructure, instead leveraging the organization's call for cloud and digital infrastructure initiatives as a way to drive adoption of innovative solutions.

Trend 5: Organizations Will Continue to Automate as Much of Their Infrastructure Processes as Possible

With the increasing scale of infrastructure accessibility, scalability, and performance, hard-pressed IT organizations will require automation to help them manage infrastructure assets spread across off-premises environments and onpremises environments. This not only enhances IT productivity but also can help enable self-service portals for other constituencies where appropriate (e.g., in provisioning new storage resources on demand when developers need them), making IT more agile and responsive to modern digital infrastructure requirements. Proactive artificial intelligence/machine learning–powered analytics and policy-driven automation of infrastructure resources and security/compliance protocols are just a few examples of solutions that can deliver significant time savings and cost savings for IT organizations as they seek to streamline infrastructure operations and deliver consistency across all physical and logical assets. Moving infrastructure operations teams away from reactive monitoring, support and service requests, and ad hoc resource provisioning allows these teams to refocus their efforts on driving AI for IT operations (AIOps) initiatives, delivering greater levels of workload portability, implementing consumption-based usage, and supporting dynamic applications while keeping a handle on cost, performance, security, and compliance.

What It Means for the Future of Digital Infrastructure

- IT infrastructure buyers will continue to evaluate infrastructure automation solutions based on their ability to deliver time/FTE reductions associated with what would be considered "traditional" infrastructure tasks such as storage/compute provisioning, load balancing, or performance monitoring. This evaluation will provide organizations with a starting point to look at measurable improvements as they reduce the hours/FTEs associated with legacy tasks and redirect personnel to innovative tasks in support of digital infrastructure initiatives.
- The future of digital infrastructure is highly dependent on the ability of complex, connected cloud infrastructure to self-regulate and dynamically optimize itself in response to real-time changes in resource demand, application performance, and end-user experience. IDC expects AIOps will continue to evolve as an important technological underpinning of this vision and a path forward for many organizations to realistically achieve this goal.



Considering TierPoint

TierPoint offers a portfolio of solutions and services built on a software-defined, hybrid infrastructure. Its flexible, microservices approach to infrastructure aligns well with many of the challenges and trends facing customers in 2021 (e.g., data management, infrastructure convergence, and data resilience). As an infrastructure services provider, the company positions itself at the critical intersection between cloud (and its many instantiations) and on-premises environments. This makes TierPoint a key partner in enabling the future of digital infrastructure as many enterprises will embark on programs to migrate and modernize infrastructure and workloads in order to enable a more digital business.

TierPoint provides a range of solutions and services for multicloud environments based on technology from VMware. TierPoint is a VMware Cloud Verified partner, which means its services are validated and optimized to work alongside a host of VMware Cloud and VMware Cloud Foundation solutions. Close integration with VMware allows TierPoint to help customers deploy infrastructure resources and applications across hybrid or private cloud, as well as converged environments, regardless of workload requirements. For example, some organizations will define their hybrid environment according to their service-level agreement (SLA) requirements, building solutions on commodity hardware. Others will seek to leverage new software tools to help scale, manage, and protect their infrastructure while still leveraging some of their capital-intensive hardware assets. TierPoint can help address either of these scenarios by leveraging a range of automated provisioning tools and life-cycle management solutions that can be deployed both on premises and in the cloud.

Relevant in the context of this paper is the fact that TierPoint also provides consumption-based subscription pricing models that align with cloud billing models. Many organizations rely on these consumption-based subscription models to make cloud migration a cost-effective option. If a customer chooses a multitenant solution from TierPoint, it can price the deployment per resource pool (which is determined by the storage, compute, and memory sizes utilized). If the customer requires a private cloud solution, it can separate the capital expenditures of the hardware from the cost of the virtual resources it will be using. Customers also can "burst" their compute and storage capacity and pay an on-demand, hourly rate as needed to accommodate emergency scale-up or scale-out situations.

Challenges

Many of the trends outlined in this analysis will drive opportunity for organizations to partner with a provider such as TierPoint to scale their infrastructure for a specific workload, application, or use case in a cost-effective and timely manner. Working with partners to drive infrastructure modernization will accelerate delivery and deployment timelines and help IT decision makers map their organization's digital infrastructure initiatives to the right set of solutions and managed services.

However, the models of partnership and service delivery required by digital infrastructure solutions can be vastly different from the traditional relationships with VARs or other types of resellers to which many organizations are accustomed. Several of the trends and solutions that have been outlined in this paper require long-term commitment and tailored engagement with extremely high levels of service delivery. This changing dynamic will continue to challenge services providers such as TierPoint to elevate both their technology services portfolios and their customer engagement models in order to help customers implement holistic infrastructure solutions that go beyond a single cloud, application, or workload stack.



Conclusion

Modern enterprises depend on the delivery of digital goods and services, which in many cases can be enabled only by responsive, scalable, and resilient infrastructure. This digital infrastructure foundation must also be able to take advantage of third party–provided and –operated solutions delivered as a service. The future of digital infrastructure does not reside just in central datacenters. Rather, it includes assets in edge locations such as network points of presence, buildings, campuses, and metro colocation facilities that deliver enhanced customer experiences, embed intelligence into business operations, and support ongoing industry innovations. The five trends outlined in this paper should serve to illustrate some of the opportunities and challenges faced by organizations as they seek

to modernize and innovate. With these trends in mind, IDC offers the following advice to technology solutions and services buyers thinking about their digital infrastructure and business initiatives:

- » Evaluate infrastructure solutions and services providers based on their ability to provide access to new technologies, capabilities, and services based on business and application requirements specific to the enterprise.
- » Establish a preference for infrastructure solutions that include automated/proactive upgrades of software and hardware assets to minimize the accumulation of technical debt and any associated security or compliance risk.
- » Evaluate infrastructure modernization efforts based on their ability to progressively reduce and/or eliminate the risk of stranded capacity and waste associated with legacy applications.
- Assume that modern applications and workloads will require infrastructure solutions that can be provisioned and managed both on premises and in the cloud and that application portability will remain constant.

About the Analyst



Andrew Smith, Research Manager, Cloud Infrastructure Services

Andrew Smith is a Research Manager within IDC's Enterprise Infrastructure Practice. Andrew's research focuses on public cloud infrastructure-as-a-service platforms and solutions, with specific focus on storage services. Andrew contributes to market sizing and forecast efforts across IDC's Public Cloud IaaS segments, as well as adjacent markets like multicloud data management, data protection as a service, and public cloud cold storage.



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O IDC Custom Solutions

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IDC Research, Inc.

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