Predicts 2022: The Cloud Moves From Technology Disruption to Business Disruption

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By Analyst(s): Gregor Petri, David Smith, Mark McDonald, Rene Buest, Ed Anderson, Yefim Natis, Sid Nag, Tiny Haynes

Initiatives: Cloud and Edge Infrastructure

Cloud computing is evolving from technology enabler to business disruptor. IT leaders responsible for cloud strategy must understand their organization's business strategy first, and then seek opportunities to leverage new and emerging cloud capabilities to accelerate that strategy.

Overview

Key Findings

- Cloud computing continues to be the most disruptive driver of delivery model change that the enterprise IT market has faced since its inception.

- Today, most enterprise organizations are evaluating and ranking cloud infrastructure and platform service providers based on their capabilities across integrated infrastructure, platform and analytical (AI/ML) capabilities.

- Leading providers of cloud infrastructure and platform services are transforming their offerings to move from technology disruption to disruption around higher-level business, compliance, societal and environmental issues.

Recommendations

IT leaders responsible for cloud and edge infrastructure strategy must:

- Accommodate the next stage of digital transformation of their organization by becoming technology companies themselves and leveraging public cloud as an enabling fabric and a connection to their cloud provider partners.
Prepare for more holistic cloud decisions by engaging with the constituencies in your organization that are responsible for the new themes that cloud computing will address, such as hybrid (anywhere) work, strategic partnering and ecosystems, industry and line-of-business requirements, and sovereignty, compliance and environmental challenges.

Adopt a more composable approach by viewing cloud computing as a fabric on which to compose and recompose adaptive business capabilities, rather than a solution to run current systems (IaaS), a platform to build new differentiating functions (PaaS) and a convenient way to consume standard application functionality (SaaS).

**Strategic Planning Assumptions**

By 2023, at least 50% of distributed clouds will be deployed as appliances owned and operated anywhere by public cloud providers.

By 2024, over 50% of the leading cloud providers will address vertical business use cases by deploying composable industry clouds.

By 2025, the carbon emissions strategies of hyperscale cloud services will be a top three criterion in cloud purchase decisions.

By 2025, sovereign clouds will address specific compliance demands of highly regulated public-sector workloads, but won't be mandated for most enterprise workloads.

By 2025, businesses leading with technology will require generative models from cloud providers as cloud becomes essential to achieving business outcomes.
Analysis

What You Need to Know

Cloud infrastructure as a service started as storage and compute infrastructure, sold as an hourly service to augment or replace data center equipment, but has evolved into full-fledged cloud infrastructure and platform service (CIPS) offerings that included managed databases, message brokers and other middleware. This created development and deployment environments capable of supporting new trends such as DevOps, serverless, continuous integration/continuous delivery (CI/CD) and IoT applications. However, a new proposition has surfaced — namely, the opportunity to make better automated decisions, by leveraging a new generation of artificial intelligence (AI) and machine learning (ML) capabilities, conveniently packaged as consumption-ready managed services.

Today, the leading “hyperscale” cloud providers are largely defined by these three waves of cloud services: infrastructure, platform and analytical (AI/ML) services. Each delivered compute services on a scale not seen previously. But hyperscale cloud providers are not intending to stop here when it comes to driving disruptive change.

In this research, we offer predictions around the main types of developments that we expect will drive the cloud value proposition forward (see Figure 1). They are happening in parallel and have interdependencies. But together they make the cloud more relevant for an expanding set of more-business-oriented constituencies within enterprise organizations.

Let’s look at them one by one.
Distributed anywhere: Cloud is no longer just an alternative data center location for running enterprise workloads. It is becoming a ubiquitous set of capabilities supporting organizations on their digital business journey available anywhere—regardless of location. These distributed anywhere offerings include distributed cloud offerings and public and private edge computing offerings, but also other emerging software- and service-based offerings that facilitate organizations to take an all-in cloud strategy approach. See 'Distributed Cloud' Fixes What 'Hybrid Cloud' Breaks and Infographic: Understanding Edge Computing.

Industry clouds: Industry clouds create value for enterprises by bringing together traditionally separately purchased cloud services in a preintegrated, but adaptable, solution. Industry clouds offer not just technical, but also business capabilities that are specifically relevant to identified vertical industries. Leaders in this space will leverage composable approaches to create industry clouds that are both modular and maintainable. See Quick Answer: What Makes Industry Clouds Different From Today's Cloud Offerings?
- **Sovereign**: Sovereign cloud is the provision of cloud services within a single geography meeting data residency and legislative requirements. Sovereign cloud helps ensure that data remains free from external jurisdiction control and provides protection from foreign legislatively enforced access. Global and local providers are exploring technical and organizational options (including having their local services managed or overseen by local providers) to offer services comparable to global cloud services that adhere to local sovereignty requirements. A complicating factor is that these requirements vary per country, or even per-country/industry combination. See [Hype Cycle for Cloud Computing, 2021](#) (the profile on sovereign cloud) and [Market Trends: Europe Aims to Achieve Digital Sovereignty With GAIA-X](#).

- **Composable**: Composable cloud services support composable enterprises. Gartner defines a composable enterprise as an organization that delivers business outcomes and adapts to the pace of business change. It does this through the assembly and combination of packaged business capabilities (PBCs). As composable has been amply covered in Gartner 2021 research, including in the just-published 2022 CIO and Technology Executive Agenda, we have not included a separate prediction regarding composable here. See [The 2022 CIO and Technology Executive Agenda: Master Business Composability to Succeed in Uncertain Times](#) and [Becoming Composable: A Gartner Trend Insight Report](#).

- **Sustainable**: A sustainable cloud refers to the use of cloud services to achieve sustainability benefits within economic, environmental and social systems. As such, a sustainable cloud refers to both the sustainable operation and delivery of cloud services by a cloud service provider as well as the sustainable consumption and use of cloud services. See [The Role of the CIO and Technology in the Enterprise Sustainability and ESG Endeavor](#), [Apply Digital Business to Sustainability](#) and [Sustainability: A Customer Priority and Provider Imperative](#).

- **Generative provider business models**: Customer expectations disrupt industries and business models. As companies become technology-intensive, their expectations of high-tech providers shift from providing reliable, cost-effective market services to working with them to create comparative advantage. As cloud providers grow business-directed revenue, rather than IT-directed revenue, they will face the need to go beyond providing standard and platform services. Entering into generative relationships provides a model for that approach. See [The Ways Generative Providers Think and Work](#).
Strategic Planning Assumptions

Strategic Planning Assumption: By 2023, at least 50% of distributed clouds will be deployed as appliances owned and operated anywhere by public cloud providers.

Analysis by: Sid Nag, David Smith

Key Findings:

- Distributed cloud is a style of cloud computing where the location of the cloud services is a critical component of the model.
- Distributed cloud services are increasingly being adopted as a special case of hybrid clouds.
- Distributed clouds provide a consistent cloud experience anywhere across the cloud estate, regardless of being deployed on- or off-premises.
- A critical component of distributed cloud is a single common control plane to administer the cloud infrastructure from public to private cloud and extend consistently across both environments.
- Distributed clouds are being extended to edge offerings in a cloud-out model.
- Distributed cloud, hyperscale edge and as-a-service hybrid solutions are distinct offerings that serve distinct markets, and should be treated and adopted as such.

Market Implications:

- Distributed cloud offerings should be a primary consideration for organizations requiring public cloud capabilities delivered in locations not supported by public cloud offerings.
- Distributed clouds can be used in some cases to meet regulatory requirements associated with data that must reside in a specific location.
- Distributed clouds are driving the growth of edge computing offerings by public cloud providers that are being built with communications service providers with 5G technologies.
- Distributed clouds will drive the adoption of applications that are latency-sensitive.
Recommendations:

IT leaders responsible for cloud strategy:

- Choose distributed clouds to ensure a consistent operating model for public and private clouds.
- Identify whether a hardware-based appliance or a software solution is the right fit for your distributed cloud needs.
- Leverage distributed cloud edge offerings to extend public cloud services to different locations across your enterprise and beyond.
- Carefully place your workloads across your distributed cloud estate based on requirements such as compliance, latency, etc.

Related Research:

'Distributed Cloud' Fixes What 'Hybrid Cloud' Breaks

A Guide to Distributed Cloud: The Next Frontier of Cloud Computing

Cloud-Out and Edge-In: How Cloud Service Providers Can Leverage the Two Edge Computing Architectures

Competitive Landscape: Hyperscale Edge Solution Providers

Top Strategic Technology Trends for 2021: Distributed Cloud

Strategic Planning Assumption: By 2024, over 50% of the leading cloud providers will address vertical business use cases by deploying composable industry clouds.

Analysis by: Gregor Petri, Jeff Casey

Key Findings:

- Hyperscale cloud providers are extending their horizontal cloud infrastructure and platform services with vertical industry functionality into broader offerings that address specific industry use cases and requirements.
Current approaches to creating industry-specific offerings vary by provider and even by industry within individual provider portfolios. Approaches vary from classic bundling of existing capabilities to creating/acquiring net new services addressing unique industry challenges to providing a unified platform for composing industry solutions from bought, built and existing heritage services. These are areas traditionally addressed with SaaS, PaaS and IaaS services, respectively.

Leading providers will turn to composability to enable sharing and reuse of cross-industry capabilities, maintain cloud scale across industry offerings and create synergies from leveraging modularity. This will be done while enabling enterprise customers using these industry cloud offerings to experience composability benefits such as adaptability and agility.

Competition for industry clouds will come from multiple sources. In addition to hyperscale cloud providers, ERP and CRM vendors, specialized independent software vendors (ISVs) and global system integrators will engage by offering both competitive and complementary products and services.

Near-Term Flag:

- Cloud offerings will span multiple categories of cloud services, including IaaS, PaaS and API-centric vertical SaaS functions that enterprises can compose and recompose to address specific industry challenges.

Market Implications:

- Cloud providers will move up the stack, from disrupting the market by offering horizontal technologies (that customers have to apply themselves to get a business outcome) to disrupting the market by delivering integrated business value, including vertical functionality.

- These offerings will increasingly be composed using packaged business capabilities (PBCs) from either the provider or from its ecosystem partners. Such PBCs can be sourced as preassembled solutions or as DIY building blocks from the industry cloud marketplace or app store catalogs.

- These vertical-oriented whole product offerings will appeal to the large majority of postchasm enterprises that are more focused on business functionality and outcomes than the tech-savvy early adopters of cloud infrastructure and platform services.
Recommendations:

IT leaders responsible for cloud strategy:

- Strive to become a more digital company by composing unique functionality for differentiating core business processes in your industry, using the PBCs of industry clouds while minimizing the amount of required coding and custom development.

- Consolidate the often disparate cloud strategies regarding the hosting of current software on IaaS, the development of new applications on PaaS and the convenient consumption of standard application functionality from SaaS into a more holistic cloud strategy, leveraging the possibilities of composability for your industry.

- Engage with current and prospective providers to assess their industry cloud strategies by matching these with your current portfolio of solutions and future requirements.

Related Research:

Quick Answer: What Makes Industry Clouds Different From Today’s Cloud Offerings?

The 2022 CIO and Technology Executive Agenda: Master Business Composability to Succeed in Uncertain Times

Strategic Planning Assumption: By 2025, the carbon emissions of hyperscale cloud services will be a top three criterion in cloud purchase decisions.

Analysis by: Ed Anderson and Tiny Haynes

Key Findings:

- Cloud sustainability refers to the creation, delivery and consumption of cloud services that are net positive economically, environmentally and socially over the long term.

- More than 90% of organizations increased their investments in sustainability outcomes in 2020 compared to investments in 2017.
Spending on public cloud services accounts for approximately 37% of total IT spending on cloud and equivalent noncloud systems, making public cloud providers some of the world's largest data center operators and critical to IT-related reductions in carbon emissions.

Public cloud operations are concentrated among the top hyperscale and SaaS providers. The top 10 largest cloud providers (by revenue) account for 70% of all IT spending on cloud infrastructure, platform and application services. Therefore, cloud sustainability initiatives should focus on the leading cloud providers.

Most leading SaaS offerings are deployed and delivered on one (or more) of the leading hyperscale cloud platforms.

Near-Term Flag:

Although public cloud providers are actively investing in sustainability (including carbon reductions, carbon offset, renewable energy, operational efficiencies, and more), the demand for public cloud services often outpaces the availability of sustainable energy resources. This will make it difficult for cloud providers to meet sustainability targets in the near term.

While essentially all cloud providers have sustainability initiatives in place, their progress in meeting carbon reduction goals and strategies for achieving net zero carbon emissions vary wildly.

Cloud service provider metrics (at the cloud data center level) and workload placement tools are still immature and sometimes not fully transparent, making it difficult for organizations to fully and accurately assess the true sustainability impacts of cloud provider selection and workload placement.

Market Implications:

Hyperscale cloud service providers are aggressively investing in sustainable cloud operations and delivery, and aspire to eventually achieve net zero emissions across all greenhouse gas scopes by 2030.

In addition to improving their own sustainability posture, cloud providers, as well as other third-party providers, will deliver tools to assist organizations in calculating and optimizing their carbon emissions, much the same way tools are used to optimize cloud spending today.
Sustainability outcomes, including greenhouse gas emissions, will become more prominent in the business strategy of all organizations. Gartner research indicates that customers, investors, regulators, employees and the public at large will continue to push organizations to improve their sustainability posture.

**Recommendations:**

**IT leaders responsible for cloud strategy:**

- Track and measure the sustainability initiatives of your public cloud providers, including their current carbon emissions and future goals. Progressive providers make this information publicly available.
- Be prepared to incorporate environmental sustainability metrics within total IT reporting, which will increasingly become a part of company disclosures, compliance and reporting.
- Establish a plan to improve your sustainability posture by leveraging the efficiency of public cloud services to reduce your organization's overall carbon emissions. Couple any cloud-enabled improvements with other carbon-minimizing initiatives for noncloud workloads.
- Work with your public cloud providers to sustainably consume cloud services. Sustainability, including carbon emissions, cannot be outsourced to your cloud provider. It takes a shared commitment from the provider to deliver, and the customer to consume, cloud services in a sustainable manner.

**Related Research:**

- **Leading Sustainability Ambition, Goals and Technology in the 2020s**
- **Define Sustainability and Leverage Materiality to Drive More Effective Strategy**
- **A CTO's Guide to Achieving Sustainability Leadership**
- **Apply Digital Business to Sustainability**
- **The Road to a Net Zero Data Center**
Strategic Planning Assumption: By 2025, sovereign clouds will address specific compliance demands of highly regulated public-sector workloads, but won’t be mandated for most enterprise workloads.

Analysis by: Rene Buest

Key Findings:

- Sovereign clouds arise in response to emerging regulatory requirements in a variety of countries and regions, such as China, Russia, the Middle East and, recently, in a number of European countries. In Europe, the U.S. Clarifying Lawful Overseas Use of Data Act (CLOUD Act) is the main cause for these concerns.

- Organizations are pressed to retain sovereign control over their data to stay compliant with local regulations.

- Sovereign clouds are offered by cloud providers in response to regulations from governments instructing regulated industries to not use cloud services that cannot guarantee isolation from foreign government interference.

- In addition, privacy legislation and consumer rights policies increasingly require consideration of data privacy risk and mitigating measures such as encryption, while regulators in financial services are mandated to manage concentration risk and limit provider lock-in and dependencies.

- In some countries, sovereignty aspirations drive beyond meeting regulation and legislation mandates. Digital sovereignty ambitions can lead to initiatives that drive independence from foreign technology providers by developing their own or open-source-based technologies.

Market Implications:

- Cloud providers continue to create sovereign cloud offerings (for example in China, Germany, France and Italy). These are based on technology from foreign vendors, but are delivered or operated by in-jurisdiction providers.

- Sovereign clouds will need to meet requirements for a customer’s local environment to run disconnected from the rest of a provider cloud for an extended/unlimited period (e.g., network disruption during a time of war or political sanctions).
Recommendations:

IT leaders responsible for cloud strategy:

- Subject proposals for sovereign cloud to the same level of risk assessment to which current public cloud providers are subjected. Do not assume that the sovereign cloud conveys any additional security or protection in itself.

- Make explicit decisions about your organization’s approach to digital sovereignty and track the cloud climate change. Base your plans on the assumption that changes in global cloud climate will potentially disrupt your business.

- Explore evaluating local cloud services for workflows that can be provided locally and do not require the scale of global offerings, and leverage third-party solutions to protect data and ensure that it is compliant with local requirements on global offerings.

Related Research:

Market Trends: Europe Aims to Achieve Digital Sovereignty With GAIA-X
Strategic Planning Assumption: By 2025, businesses leading with technology will require generative models from cloud providers as cloud becomes essential to achieving business outcomes.

Analysis by: Mark McDonald

Key Findings:

- Businesses leading with technology value the proactive providers that work with them in a business, operational and technical context, according to Gartner's 2020 Industry Line of Business Buyers Survey (see Survey Analysis: Industry Line-of-Business Buyers, 2021). This is in contrast to providers that work on fitting their solutions by requiring the business to change its processes, technology, etc.

- Cloud provider growth is expected to rotate from providing market standard services toward more industry and functional solutions.

- Generative provider business models offer a path forward for current cloud business models to evolve and tap into growth from industry and functionally specific solutions.

Near-Term Flag:

- Cloud providers partnering to not only migrate applications of their customers to the cloud, but also co-create new solutions specific to an individual company.

Market Implications:
Business and IT leaders will press cloud providers to move from technical migration toward business outcome realization via cloud technologies and innovations.

Cloud providers will need to find their next margin-rich line of business as cloud modernization and infrastructure as a service (IaaS) markets mature.

Continued strong cloud growth rates require expanding beyond CIOs and IT departments to tap into business and operational spending.

Cloud providers adopting generative business models blur the lines between technology products and services. This will disrupt both cloud provider and IT service provider marketplaces.

Competition among cloud providers will evolve from scale, cost and reliability of service to the ecosystem to the portfolio of industry- and functional-specific services offered by the cloud provider.

Recommendations:

IT leaders responsible for cloud strategy:

- Evaluate your cloud migration and transformation program to identify its business rather than technical outcomes. Make these outcomes the focus of the transformation program.

- Identify how well current providers are able and willing to work toward these outcomes. Pay particular attention to the willingness of a provider to work with technologies outside of its current products and services that are strongly connected to your business outcomes.

- Consider reorienting relationships with cloud service providers toward jointly sharing risk and return with them and other service providers, as part of an ongoing relationship rather than a technical, transactional one.

- Engage business leaders with the potential for achieving their business outcomes and results faster, and with greater effect, through a generative relationship.

Related Research:

Tech Providers 2025: The Generative Future of High-Tech Providers
The Ways Generative Providers Think and Work

An Anatomy of a Generative High-Tech Provider Business Model

A Look Back

In response to your requests, we are taking a look back at some key predictions from previous years. We have intentionally selected predictions from opposite ends of the scale — one where we were wholly or largely on target, as well as one we missed.

On Target: 2018 Prediction — By 2021, over 75% of midsize and large organizations will have adopted a multicloud and/or hybrid IT strategy.


In 2020, Gartner conducted the Cloud End-User Buying Behavior Survey to better understand how technology leaders approach buying, renewing and using cloud technology. The survey ran from July through August 2020 among 850 respondents from midsize and larger ($100 million or more in revenue) organizations in the U.S., Canada, the U.K., Germany, Australia and India. From this survey, we concluded that.

The prediction for 2019 asserted that the number of companies using either a combination of internal IT and cloud (hybrid IT) or more than one cloud provider would be larger than 75%. The survey found that 63% of respondents indicated they had one provider they considered to be their “primary” cloud provider and one or more additional providers, and another 13% indicated they had multiple cloud providers, but no distinct primary provider. Given the total of 76% for the two alternative scenarios, we conclude the prediction to be correct regarding the use of multicloud.

Missed: 2016 Prediction — By 2021, only providers offering a continuum of their own or affiliated IaaS, PaaS and SaaS will compete for overall cloud market leadership.

Although we have observed the market for IaaS and PaaS largely merging into the market that Gartner now calls CIPS, this has by and large not been the case for SaaS. SaaS vendors still sell their offerings largely as stand-alone independent application offerings. We did see SaaS vendors bundle or combine PaaS capabilities with the application offerings. So one could say that, in 2021, we see the market largely divided into IaaS+PaaS (aka CIPS) providers on the one hand, and SaaS+PaaS providers on the other.

That may, however, change with the introduction of composable industry cloud offerings, where providers are expected to offer application functionality in the form of composable building blocks (PBCs) combined with infrastructure, platform and analytical AI/ML capabilities (see the discussion of industry clouds elsewhere in this research or see Quick Answer: What Makes Industry Clouds Different From Today's Cloud Offerings?).

Given the above, we conclude that our original prediction for 2017 about an IaaS-PaaS-SaaS continuum becoming the norm for cloud service acquisition was too aggressive.

**Document Revision History**

Predicts 2021: Building on Cloud Computing as the New Normal - 14 December 2020

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Tech Providers 2025: Strategic Impacts to the Competitive Landscape

Infographic: Where Next? Technology Leadership in a World Disrupted

Emerging Technologies and Trends Impact Radar: Cloud Computing