

White Paper

Kyndryl and Azure: Driving Cloud Modernization and Operational Excellence for Hybrid Multicloud Needs

Sponsored by: Kyndryl

Peter Marston
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David Tapper

EXECUTIVE SUMMARY

Today's business is operating in an environment in which being very agile and resilient is the means by which to ensure competitive advantage and success. This need for agility and resiliency is driven by an array of market conditions from the ability to use public clouds that can personalize and localize services and changing workforce demographics, resulting in new worker requirements, to events such as the COVID-19 pandemic and climate change that are forcing society to adapt to new environmental conditions and increased geopolitical instability, leading to changes in international trade.

In creating highly flexible and resilient organizations, enterprises are turning to managed service providers (managed SPs) to help implement hybrid multicloud environments utilizing managed cloud services. However, to optimize the value of hybrid multiclouds, enterprises expect managed SPs to help migrate and modernize IT to the cloud as well as effectively manage and orchestrate these vast set of cloud resources utilizing an array of new processes, innovative technologies, and partnerships with hyperscalers. Firms also want managed SPs to support heterogeneous environments involving mainframes. Ultimately, by partnering with managed SPs, firms are looking to meet key business and IT objectives such as becoming more agile, improving customer experience, linking IT to business performance, and achieving critical performance key performance indicators (KPIs) while simultaneously making fundamental shifts in how to manage IT at both global and local levels.

Kyndryl, a global managed SP, works with Microsoft Azure to support enterprises in optimizing the value of hybrid multiclouds in order to achieve strategic business and IT objectives. Together, Kyndryl and Azure accomplish this by providing enterprises with a full life cycle of services that span migrating, modernizing, and managing hybrid multicloud environments, which support the full breadth of technologies from mainframe to cloud along with innovative capabilities (e.g., IoT, 5G, containers) and processes (e.g., CI/continuous delivery [CD], DevOps, SRE). This partnership is structured to develop state-of-the-art solutions that are built on the Microsoft Cloud (Azure) and to help accelerate adoption of hybrid multicloud capabilities, modernize applications and processes, support mission-critical workloads, enable modern work experiences, and align to customers' digital transformation journeys.

Finally, Kyndryl differentiates its hybrid multicloud services and capabilities by leveraging its mission-critical and depth of expertise, unique intellectual property (IP) and innovation, and ability to manage complexity at scale. Underpinning this differentiation is providing firms with access to an extensive pool of certified professionals across Azure and different technology disciplines, portfolio of patents, and breadth of technologies and partners as well as Kyndryl's ability to provision hybrid multicloud

capabilities globally while continuously investing in new means of modernizing and managing these environments.

IDC Definition of Hybrid Multicloud Management

When it comes to utilizing managed services from managed SPs to support enterprise cloud needs, IDC defines hybrid multicloud management as an engagement between customers and managed SPs that involves managing multiple clouds from different sources. This is a form of multisourcing, which also includes the full life cycle of cloud services spanning from designing, migrating, and modernizing to managing hybrid multiclouds. IDC identifies two fundamental types of these engagements:

- **Multiple public clouds – managing two or more clouds from different cloud providers.** This would involve a managed SP helping support multiple clouds from different public cloud providers across IaaS, PaaS, and SaaS business models (e.g., AWS, Azure, Google Cloud Platform [GCP], IBM, Workday, ServiceNow, and salesforce.com).
- **Hybrid cloud (private plus public) – managing enterprise private clouds and clouds from cloud providers.** Combining an enterprise private cloud with a public cloud from a public cloud provider would be classified as a hybrid cloud engagement (private plus public). This type of engagement can also include managing more than one cloud from different public cloud providers (IaaS, PaaS, SaaS) in addition to supporting an enterprise private cloud. Further, private clouds when consumed as part of a hybrid can be provisioned either on premises or in a hosting environment and can be either custom built or utilize a standardized solution from different types of vendors (e.g., OEMs, public cloud providers).

MARKET OVERVIEW

Enterprises are faced with a myriad of challenges in achieving their business and IT objectives as well as the level of agility and business resilience needed to ensure competitive advantage. In responding to these challenges, enterprises have made cloud the core means of consuming and delivering IT services that can meet these needs and can also address newer issues such as enabling greater flexibility of workforces across locations including remote work, optimizing functionality of facilities (e.g., shift office building to warehouse, change type of production in a manufacturing plant), addressing how to adapt business process to accommodate for the impact of a changing climate (e.g., wildfires, rising tides, storms), and supporting shifting workplace requirements to align with different workforce demographics (e.g., millennial generation, baby boomers).

In utilizing cloud to run today's business, enterprises are focusing increasingly on leveraging hybrid multiclouds. However, firms are also looking to incorporate use of different types of cloud platforms (IaaS, PaaS, SaaS), new processes to create agile delivery (e.g., CI/CD, DevOps, SRE), new means of collaborating, innovative technologies (e.g., IoT, edge computing, 5G), and use of multicloud management platforms to manage and control all IT and cloud resources. In addition, firms are grappling with the best migration and modernization strategies that can effectively accelerate their use of hybrid multiclouds, which increasingly includes moving enterprise applications (e.g., CRM, ERP, SCM) to public clouds while also optimizing existing investments in IT.

The Business and IT Value of Managed Cloud Services

A strategic means by which enterprises are incorporating hybrid multicloud as their core means of consuming and delivering IT services while achieving their business and IT objectives is through the use of managed cloud services via managed SPs. As Figure 1 highlights, the business value that firms

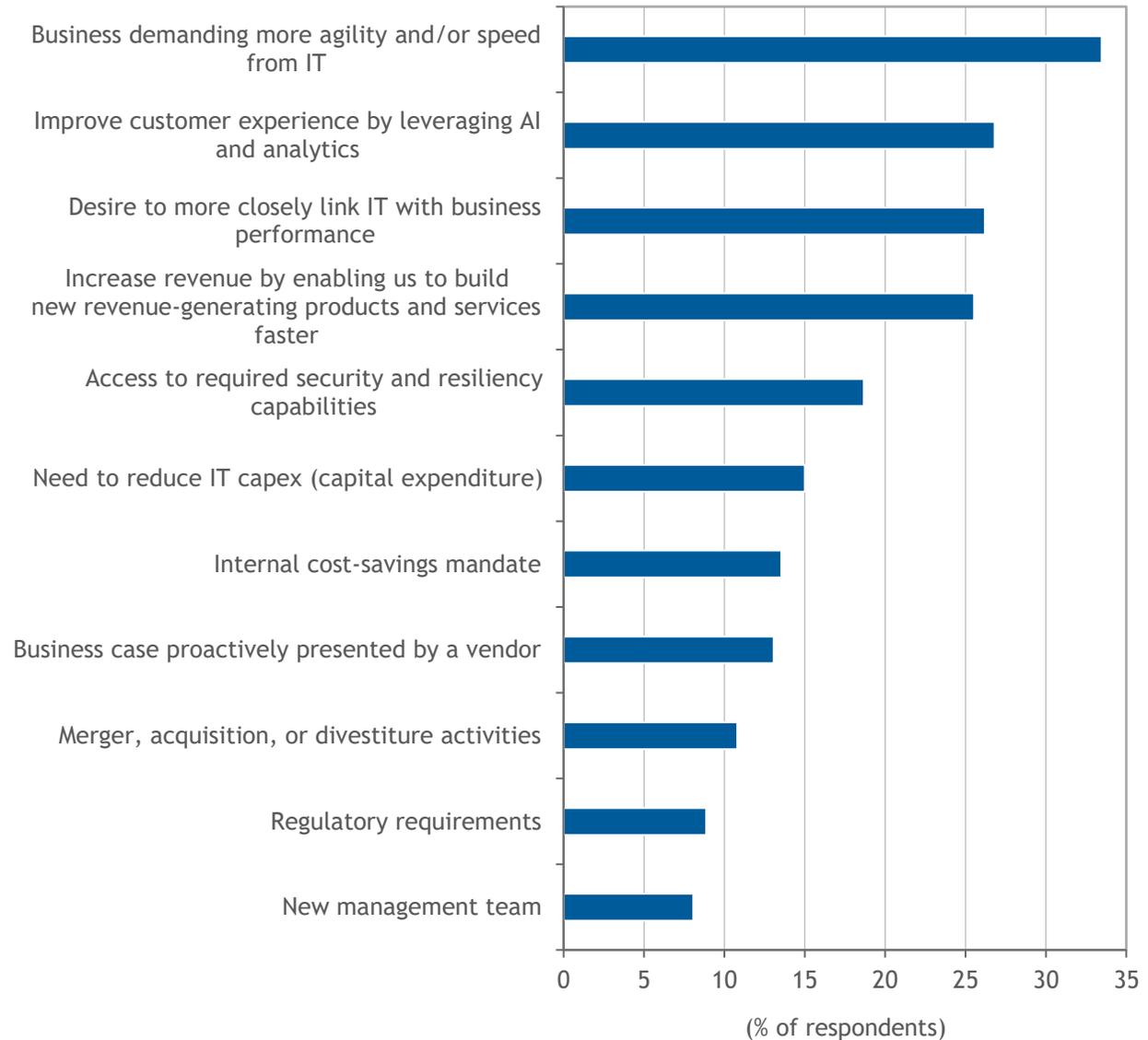
place in utilizing managed cloud services is led by supporting business demanding more agility and/or speed from IT, followed by improving customer experience by leveraging artificial intelligence (AI) and analytics, more closely linking IT with business performance, and increasing revenue by enabling new revenue-generating products and services faster. From an IT perspective, businesses expect managed cloud services to help simplify and standardize IT infrastructure and applications platforms on a global basis and restructure IT financial footprint and shift from capex to opex while also using these services as a means to building a new approach in managing IT.

In determining the success of using managed cloud services, enterprises look to KPIs. Firms indicate that the top KPIs to measure business success of these services should focus on supporting improved personalization of internal services for users, driving product innovation and market thought leadership, and improving employee satisfaction and retention, though some industries are looking for even more granular measurements such as supporting greater localization of products by geography. From a financial perspective, customers look to KPIs involving productivity gains (e.g., revenue per employee) and return on investment (ROI). Finally, in measuring the quality of service, utilization rates of IT (e.g., 95%) and availability of services (e.g., 99.99% uptime) are paramount in determining success.

FIGURE 1

Worldwide Business Drivers for Managed Cloud Services

Q. Which two of the following do you believe are the primary business drivers in utilizing managed cloud services?



n = 1,500

Source: IDC's *Worldwide Managed CloudView Survey, 2022*

Optimizing Hybrid Multicloud Capabilities in Meeting Strategic Requirements

According to IDC, the managed cloud services market for hybrid multiclouds is projected to grow at a five-year compound annual growth rate (CAGR) of 15.5% to \$90.0 billion worldwide by 2026. As these

figures highlight, the demand for these services is growing rapidly. In leveraging managed cloud services to support hybrid multicloud requirements, enterprises are expecting managed SPs to help optimize how each aspect of a hybrid multicloud, private versus public, should be utilized, which includes where to deploy assets and innovative capabilities (e.g., enterprise applications, IoT, cognitive, analytics, blockchain) across different combinations of private and public cloud resources as well as on which hyperscaler platforms (also referred to as public cloud providers) to provision these capabilities.

However, managed SPs must also ensure that the private and public cloud aspects of a hybrid multicloud environment support key business and IT needs such as providing access to better security, meeting regulatory requirements, optimizing ROI, standardizing IT infrastructure and applications platforms, reducing total size of IT budget, and improving IT staff productivity. In addition, managed SPs must implement hybrid multiclouds that meet the following critical operational and financial requirements:

- **Public cloud.** On the public cloud side of a hybrid multicloud solution, the role of a public (IaaS) cloud is to provide access to public IaaS cloud capabilities, support surges in demand that may need to span multiple hyperscalers where required, ease repatriating of public IaaS cloud services back to private clouds, and eliminate need for capex investments.
- **Private cloud.** When it comes to the private cloud aspect of a hybrid multicloud, enterprises want to utilize a standardized private cloud (IaaS) infrastructure (dedicated to their company/organization) from a managed SP to ease integration with public cloud provider platforms more quickly (e.g., AWS, Alibaba, Azure, Google, IBM), add extra private cloud capacity when needed, commit for shorter spans of time contractually (e.g., one year), simplify management of both private and public cloud resources, and deploy and/or terminate use quickly.

Additional factors that managed cloud services can address via use of hybrid multiclouds involve edge computing, landing zones, and sovereign needs. In utilizing the private cloud aspect of hybrid multiclouds, firms can support use of edge computing where they need to scale rapidly, minimize latency, and secure availability of applications, which can include supporting 5G and IoT requirements. Firms can also ensure operational excellence by deployment of landing zones that enable close proximity between private and public clouds, which can minimize latency while improving availability of services. Finally, utilizing these landing zone structures for hybrid multiclouds can help meet not just data sovereignty regulations but also other industry regulations in which firm information or processes need to be kept safeguarded in a private cloud and increasingly located within a geographic jurisdiction (e.g., country).

Creating an Effective Migration and Modernization Strategy

To achieve cloud migration and operational excellence, enterprises are pursuing a wide array of migration and modernization strategies. These strategies span migrating legacy and custom-built applications and infrastructure to private and public clouds as well as transforming existing environments to better integrate with modern technologies. Not only does this include re-architecting existing mainframe and legacy environments to facilitate easier integration with the cloud for applications that may be better suited to remain on the mainframe or traditional environments but also includes migrating, modernizing, rehosting, and replatforming legacy and mainframe applications (e.g., custom coded – COBOL, homegrown) or older packaged applications (e.g., SAP, Oracle, Microsoft) onto cloud platforms as well as developing new code designed for the cloud. As part of this transformation journey to the cloud, enterprises expect managed SPs to incorporate new processes,

such as CI/CD, DevOps, and SRE, along with standardized templates, blueprints, and reference architectures to not only establish the foundations that support continuous innovation and operational excellence but also provide access to centers of excellence (COEs) that span public cloud hyperscalers and traditional or dedicated environments. Fortunately, most of the common tools that enable agility are fully supported on all platforms, including the mainframe facilitating process integration across the enterprise, ISVs (Oracle, SAP, Microsoft), and modern technologies that include security, cognitive/AI, 5G, IoT, and blockchain. Such capabilities can enable managed SPs to develop solutions specific to client needs and to ensure solutions will work before deploying them in a much more rapid fashion than enterprises could do on their own while ensuring higher quality and minimizing defects. Further:

- **Base application modernization and migration on business objectives and benefits.** IDC has found that an effective migration and modernization strategy consists of defining key KPIs that help enterprises achieve business objectives while identifying the optimal combination of cloud resources to utilize. Such KPIs tend to center on improving employee productivity, achieving cost reduction goals, improving supply chain optimization, driving product innovation and market thought leadership, and increasing ROI.
- **Establish a structured, yet flexible and lean, governance model.** When it comes to governance, IDC has found modernization initiative success is dependent upon having a governance model that monitors the progress of modernization activities and facilitates communication as well as establishes roles and responsibilities. Modernization initiatives must be spearheaded by executive sponsorship from the lines of business (LOBs) with IT support and guidance as well as have formalized project governance at initiative initiation. Such a structure enables strategic decision making as well as fortifies course corrections when and if modernization issues surface.
- **Assess and road map which applications require modernization.** Optimizing cloud resources requires assessing application portfolio priorities to determine which workloads – like ERP, SCM, and CRM – and application types – like custom built/homegrown, mainframe, and packaged applications (i.e., SAP, Oracle) – to migrate. In addition, core to the migration strategy is identifying which type of cloud to migrate – whether public, private, or hybrid cloud – or to retain, replace, or retire the applications on their current platform. Here is where enterprises wrestle with which pathways to take (e.g., rehost, platforming, refactor, recode) and which type of application architecture to use such as Kubernetes, services, containers, and microservices.
- **Build a scalable data and technical architecture based on portability and reuse.** Core elements of modern application architectures focus on leveraging composable and modular underpinnings. Kubernetes and containers can serve as primary cornerstones to enable organizations to transfer IP and technical solutions and assets more easily and seamlessly across a variety of technologies and hosting environments.
- **Create a modern data fabric.** Data has become a key enabler for enterprises to differentiate, through utilizing more contextual insights drawn from more vast and diverse data sources and empowering enterprises to make smarter decisions whether for operations or customer experience. To harness the power of data, organizations need to not only have data repositories but also have mechanisms to utilize structured and unstructured data and content in ways that are consumable, timely, and relevant. This modernization effort requires enterprises to build data lakes and surround those repositories with tools like machine learning (ML) and artificial intelligence to mine and extract key analytics that better support highly integrated and cross-functional business processes.

- **Use new processes and repeatable frameworks.** Enterprises expect managed SPs to incorporate new processes (CI/CD, DevSecOps, SRE) and cloud-native operating frameworks along with standardized templates, blueprints, and reference architectures that can support continuous innovation and operational excellence. Through leveraging new processes and repeatable frameworks, enterprises can not only drive speed and time to value but also uplift quality.
- **Embed security and compliance within the architecture and modernization fabric.** Security needs to be enveloped as part of the strategy due to issues like data breaches, heightened systems vulnerabilities, and increased distribution of malware. Rather than being an appendage after solutioning, security must be embedded as part of the modernization architecture to ensure data protection and eliminate vulnerabilities.

Through buyer interviews on modernization and migration best practices, IDC has found that change management and cultural transformation are critical elements that often are overlooked when it comes to evolving application delivery methods, talent, and culture. Transforming applications to more modern technologies requires different skills for management, and processes for maintenance and enhancements need to evolve. Along these lines, organizations must evolve staff skills to continuous delivery methods like agile, scrum, and DevOps where teams are no longer siloed across functions, but rather collectively organized across discipline areas using a product life-cycle mentality for ongoing application evolution. In addition, cultural transformation to support modern approaches to application life cycle must start with grassroots movements and be supported by executive management through incentives-based change. Simply instituting modern delivery methodologies won't lead enterprises to achieve modernization success. Rather, resources must understand rationales for utilizing newer methods and be vested in adopting application delivery methodology change for true benefits to be achieved.

Implementing Robust Governance: Control and Performance

As a measure of market pressures that firms need to manage, enterprises are faced with supporting more stringent levels of service delivery. According to IDC research, 5% of firms want to deploy an application as part of a managed cloud service within a day or less, and 21% want to do so within one week or less. Meanwhile, 64% of firms indicate the need for 99.9% of availability before there is significant financial and/or regulatory impact on their business. Given these factors, enterprises must have a means of controlling how they consume all their cloud and IT resources while meeting both strategic and tactical expectations of users and stakeholders. This requires that enterprises implement a robust governance structure.

IDC research does show that enterprises are looking to managed SPs to assist them in creating the right governance structure that can support critical requirements such as operations and performance management objectives (service-level agreements [SLAs]), data management and sovereignty, defining policies/metrics in utilizing cloud, and risk and compliance management. Critical technology and process capabilities for which firms expect managed SPs to help ensure effective governance must involve the following:

- **Multicloud management.** IDC research shows that over the next three years, firms indicate the use of multicloud management platforms to manage across all IT and cloud resources will be a top priority. Capabilities that these platforms must offer span a wide array of functions that include supporting all public cloud providers, helping standardize IT environments, offering comprehensiveness of visibility into IT operations, and enabling the speed at which value is generated. To assist enterprises in measuring the value of their services, these platforms need

to offer analytics capabilities that can assess quality of services; support demand management to assess, track, and forecast demand for products and services; and determine business value.

- **Automation.** Enterprises also view automation in the form of cognitive/AI/ML as critical components in aiding their ability to effectively support their governance requirements in managing their cloud resources. Key objectives in using these technologies are to help drive efficiencies in IT operations, align consumption of IT with individual needs that can support personas (e.g., developers, IT operations, CFO, CIO, CTO, LOB), and link business process to IT. Automation, which can also include use of capabilities involving infrastructure as code (IaC) and no code/low code, can also help meet critical KPIs such as time to market and availability of services.
- **Security and resiliency.** Governance needs to incorporate security management along with data management and sovereignty. In addition, a majority of enterprises and organizations want to bundle disaster recovery with managed cloud services with the primary focus on systems recovery and enterprise applications involving CRM, SCM, and ERP, though managed SPs also need to offer a range of different cloud options (private, public, hybrid) to support data recovery needs spanning backup, disaster recovery, and archiving.
- **Sustainability.** With climate change (e.g., wildfires, rising tides, storms) requiring adjusting resource deployment (e.g., workforce, facilities, transportation), enterprises are looking to incorporate sustainability solutions as part of managed cloud services. These solutions include replacing datacenters with IaaS from public cloud providers (e.g., AWS, Azure, Alibaba, IBM, Google), utilizing virtualization, and implementing analytics to help determine the optimal approach.

Kyndryl and Azure: Delivering Hybrid Multicloud Management Capabilities and Services

To meet the wide array of client requirements in utilizing hybrid multiclouds, Kyndryl has developed a strategic partnership with Azure. Through this partnership, Kyndryl and Azure can support enterprises across the full life cycle of services including architecting, developing, testing, deploying, and managing hybrid multiclouds, which include both private and public clouds, as well as noncloud (legacy) technologies. The goals of these services are to assist clients in their client journey to and use of cloud for mission-critical capabilities while meeting critical business and IT objectives. More specifically, the synergies of Kyndryl and Azure in delivering these hybrid multicloud services are designed to address the following:

- **Joint value.** The partnership between Kyndryl and Azure is structured to provide enterprises with state-of-the-art solutions that are built on the Microsoft Cloud (Azure) and to accelerate hybrid cloud adoption, modernize applications and processes, support mission-critical workloads, enable modern work experiences, and align to customers' digital transformation journeys.
- **Strategic focus of partners.** Kyndryl and Azure can jointly bring customer solutions to market in the areas of data modernization and governance, AI-driven innovations for industries, cybersecurity and cyber-resiliency, and transformation of mission-critical workloads to the cloud. Azure will provide use of and access to its cloud platform solutions as part of provisioning hybrid cloud capabilities, while Kyndryl will lead the client relationship with advisory, implementation, and managed services for complex hybrid IT environments.
- **Critical investments.** Core elements to this partnership will be on developing new solutions for enterprises and creating programs to advance skills, which includes use of a co-innovation lab

that can accelerate and bring new capabilities built on Microsoft's Azure Cloud to the market. As part of these investments, Microsoft has created the "Kyndryl University for Microsoft" to help strengthen and expand technical expertise and skills in using Microsoft's Azure cloud platform for Kyndryl professionals.

Value Proposition and Differentiation

Value Proposition

By combining the depth of experience and talent, technological breadth, and scale across both Kyndryl and Azure, this combined entity is focused on benefiting customers by delivering strategic business value and outcomes in utilizing hybrid multicloud capabilities. The core benefits that the partnership between Kyndryl and Azure provides customers in utilizing hybrid multiclouds involve the following:

- **Delivering business outcomes.** Deliver business outcomes that focus on top-line and bottom-line benefits throughout the IT investment life cycle and which is supported by providing critical insights into the operations of a hybrid multicloud environment through advanced analytics and automation utilizing Kyndryl Bridge.
- **Cocreating solutions.** By cocreating with Azure, provide first-of-a-kind solutions addressing specific business, industry, and technology requirements that are unique to client businesses and drive differentiation.
- **Accelerating time to market and continuous innovation.** Accelerate time to market and enable continuous innovation by utilizing a range of capabilities that include use of repeatable blueprints, accelerators, and templates to help orchestrate and automate delivery of infrastructure, application, and custom IT services; implementation of fast-track AI discovery and pilot development capabilities; and provisioning of a standard, scalable, and secure cloud platform across private, public, and hybrid cloud models.
- **Ensuring agility.** Enable agility through use of the scalable Azure cloud platform, an agile delivery model employing DevSecOps principles, Kyndryl's agile squad and feature team model that has been tested at scale and over multiple geographies, and a self-service portal that supports on-demand automated workload deployment and life-cycle management. In addition, agility is enhanced by managing changes in skills and staffing requirements as workloads move between platforms.
- **Optimizing productivity.** Optimize productivity across both business and IT through deployment of a data modernization strategy that creates a road map of data needs by personas (e.g., org level, BU level, or business case level) and implementation of DevOps and application modernization processes using an integrated development environment (IDE) that can maximize programmer productivity.
- **Implementing regulatory and resiliency requirements.** Support data, security, and compliance policies as aligned with geographic and industry-specific regulations utilizing a range of capabilities (e.g., security, recovery, localization) as well as industry expertise.
- **Ensuring financial management and control.** Ensure effective financial management and control of hybrid multiclouds by utilizing consumption-based pricing involving pay-as-you-go cloud operations, supporting enterprise shift from capex to opex, and incorporating a single pane of glass via a combination of Kyndryl Bridge and Azure's Arc and Lighthouse management platforms.

Differentiation

Kyndryl differentiates its hybrid multicloud services and capabilities by leveraging its mission-critical and depth of expertise, unique IP and innovation, and ability to manage complexity at scale:

- **Mission-critical expertise.** Delivers mission-critical capabilities that span areas such as infrastructure and application modernization on Azure, cybersecurity, enterprise applications including SAP, and modern work, all of which are supported by more than 10,000 Azure certifications and 1,200 certified practitioners in new technology disciplines for highly regulated industries
- **Unique IP and innovation.** Utilizes unique IP that includes a portfolio of more than 3,000 patents to support complex technology environments as well as a range of innovative capabilities such as Kyndryl's Global Scaled Agile Approach that uses a unique engineering platform, which automates engineering using agile processes and reduces time to value, and Kyndryl's automation pattern library for deployment, onboarding, and Day 2 operations
- **Depth of expertise.** History of supporting thousands of clients and their strategic initiatives for more than 30 years, which has resulted in building a deep repository of expertise and insight into how to design, build, and manage mission-critical IT solutions as well as developing an extensive set of skills and resources in managing any type of infrastructure while supporting an expanding portfolio of application management needs
- **Managing complexity at scale.** Ability to manage complex environments that span legacy (noncloud) and cloud environments, a broad portfolio of technology environments (e.g., applications, infrastructure, platforms), and an extensive ecosystem of partners (e.g., technology, hyperscalers, colocation/telecommunications), as well as having the scale required to deliver these services across geographies, different types of users, industries, and business processes

Overview of Kyndryl's Cloud Services Portfolio for Hybrid Multicloud

Kyndryl provides enterprises with a full life cycle of services for hybrid multiclouds from strategy, planning, and assessment to deploying, monitoring, and managing cloud services. These services include supporting different types of clouds (private, public, hybrid) and cloud platforms (IaaS, PaaS, SaaS), for which Kyndryl looks to simplify and accelerate the journey to the cloud by infusing standardization and automation at every stage across this life cycle.

Core to supporting client journey to the cloud is Kyndryl's A&IS (advisory and implementation services) practice. A&IS provides a flexible set of migration and modernization pathways in moving to a hybrid multicloud model that support multiple technology environments (e.g., applications, infrastructure, data), which can also involve implementing the necessary network and resiliency requirements. In optimizing the synergies between Kyndryl and Azure to migrate and modernize IT to the cloud, Kyndryl's method and practices are aligned to the Microsoft Cloud Adoption Framework for Azure with the goal of driving value for new and existing application workloads. Key capabilities that these services support involve the following:

- **Cloud strategy and optimization.** Aligning platforms and services to an enterprise's business strategy with a unifying Azure, hybrid, or multicloud strategy and road map
- **Cloud and landing zone design.** Designing a unifying cloud solution architecture that meets business requirements based on a specific hybrid cloud or multicloud estate and that utilizes highly automated and templated landing zone deployment capabilities

- **Platform and infrastructure modernization.** Creating the blueprint for a platform and infrastructure modernization that is aligned to value chains and transformation goals
- **Modern operations and management.** Establishing a solid foundation for management of cloud platforms via DevSecOps, automation, and AIOps initiatives along with the use of SRE capabilities, which also involves implementation of mainframe practices into existing DevOps infrastructure with a focus on transforming the mainframe developer experience and enabling a CI/CD pipeline to manage mainframe assets and development

Pathways to the cloud that Kyndryl supports range from assessing and migrating standardized environments to Azure public cloud and migrating on-premises VMware to Azure VMware Solution (AVS) as a transitory step until the client is ready to modernize to the Azure public cloud to more complex migrations and modernizations involving mainframes and enterprise applications. Key areas of focus for Kyndryl's migration and modernization offerings include the following:

- **SAP.** Kyndryl utilizes a methodology for SAP migration and modernization to the cloud that is based on in-depth experience including industry best practices and spans the full stack of technology addressing applications and infrastructure. This methodology involves identifying workload suitability for SAP HANA cloud, creating a modernization rollout plan, providing an SAP application discovery and assessment report, incorporating hypercare support, and migrating to a target operating model.
- **Microservices and cloud-native applications.** Kyndryl can modernize applications to container-based platforms and microservices that includes building cloud-native applications for Azure. Key capabilities that Kyndryl utilizes include application discovery, remediation, containerization, and database replatforming with the goal of deploying to a firm's chosen container platform on the Azure public cloud, one of which can include use of Red Hat OpenShift.
- **Core Enterprise and zCloud.** Kyndryl can migrate and modernize mainframe platforms involving IBM Z and IBM i to the cloud whether as a permanent solution or as a step during the migration of these platforms by hosting these platforms in a cloud model while also retaining all the capabilities and benefits of the modern mainframe. Together, Kyndryl and Azure can build a hybrid multicloud environment that is designed to support lower latency by collocating mainframes close to Azure public clouds; enables use of DevOps via application integration, which can keep applications on IBM mainframes while being able to update and manage these applications via tools hosted on Azure; supports the ability to access data hosted on mainframe through data integration; allows clients to manage both platforms (mainframe and public cloud) from only one tool interface hosted on Azure; and provides consumption-based solutions that remove the need for capex.
- **Data and AI Services on Azure.** Utilizing its global data management team of more than 350 experts and more than 50 data scientists, Kyndryl provides data modernization services that combines Azure Data & Analytics with AI/ML services, resulting in the creation of a modern enterprise data fabric that leverages analytics at scale. Key elements of data modernization include migrating data warehouse workloads to Azure Synapse Analytics and helping achieve industry data visualization with Power BI. Further, Kyndryl utilizes the Azure data platform to manage enterprise data lakes, data warehouses, and analytics/AI/ML workloads in a cost-efficient manner with minimum overhead.
- **Windows and SQL Services for Azure.** Kyndryl supports migrating legacy Microsoft technologies, such as Windows and SQL, to Azure public cloud, which can also include migrating to Azure capabilities involving AVS, Azure SQL, NetApp on Azure, and Blob Storage.

- **Private cloud.** Kyndryl supports use of the Azure Stack private cloud that can be deployed at any location including Kyndryl datacenters or colocation centers as part of a hybrid multicloud.

Finally, to accelerate the development of a client's preferred hybrid multicloud solution, Kyndryl utilizes a proof-of-concept (POC) approach involving minimal viable product (MVP) by which Kyndryl can deliver outcomes of a proven implementation strategy in as little as 8-12 weeks. This process incorporates an IT strategy and road map with clear alignment to business objectives, a target architecture for digital platforms and workload transformation, a high-level target operating model for IT, a compelling business case for transformation, and a structured implementation road map.

Kyndryl's Hybrid Cloud Services for Azure Ecosystem

In working together, Kyndryl and Azure are supporting hybrid multicloud environments and are focused on effectively building and managing Azure environments irrespective of where they are deployed with the goal of achieving the following for clients:

- **Seamless and fast pluggable operations.** Deliver seamless operations across hybrid deployments by leveraging a combination of Azure native and third-party tools.
- **Secured and controlled onboarding.** Provide centralized access and policy governance through Azure Lighthouse to enable easier and faster onboarding.
- **Automated, standardized, and secure deployments.** Incorporate standardized deployment templates for faster provisioning using IaC principles.
- **Immutable and CIS benchmark compliant.** Maintain CIS compliance posture across Azure hybrid as aligned with Azure Security Center.
- **Manage, govern, and optimize.** Transform operations utilizing the Kyndryl Cloud Native Framework and Azure Cloud Adoption Framework (CAF) while leveraging Azure services like Arc and Lighthouse along with integrations with Kyndryl Bridge to deliver operational excellence.

Kyndryl and Microsoft also provide clients with an end-to-end set of solutions that help create data pipes between the mainframe, including the IBM zCloud platform and the Microsoft cloud, and which are designed to simplify the process of moving mainframe data to the cloud, provide a holistic view of a firm's data estate, and enable firms to achieve their application and business modernization goals. More specifically, Kyndryl and Microsoft can support enterprises in optimizing the combined value of mainframe data and Microsoft cloud capabilities no matter where data is located (e.g., on premises, hosted, or at the edge) in the following areas:

- Make mainframe data more accessible across an enterprise's organization with cloud-based application integrations like machine learning and AI
- Combine mainframe data with other internal and external data sources to create new applications that deliver value
- Leverage modern analytics and visualization tools to deliver business intelligence at scale
- Integrate mainframe data into low-code and no-code applications like Microsoft Power Platform to enable a data-driven business environment

Kyndryl can cocreate a strategy and road map with clients to make mainframe data more accessible across an organization through a two-day workshop with business and technology experts. This face-to-face workshop will help identify business priorities, support creating a technology framework to unlock mainframe data, prioritize projects that drive value for a business, and demonstrate data visualization and insights capabilities.

Finally, Kyndryl also assists firms in democratizing mainframe data and making the data accessible across an organization using its full portfolio of services. These services include designing and executing a POC to highlight the potential business value of unlocking enterprise data on the mainframe as well as the requisite advisory, planning, and managed services needed to road map and scale out POCs into broader implementations.

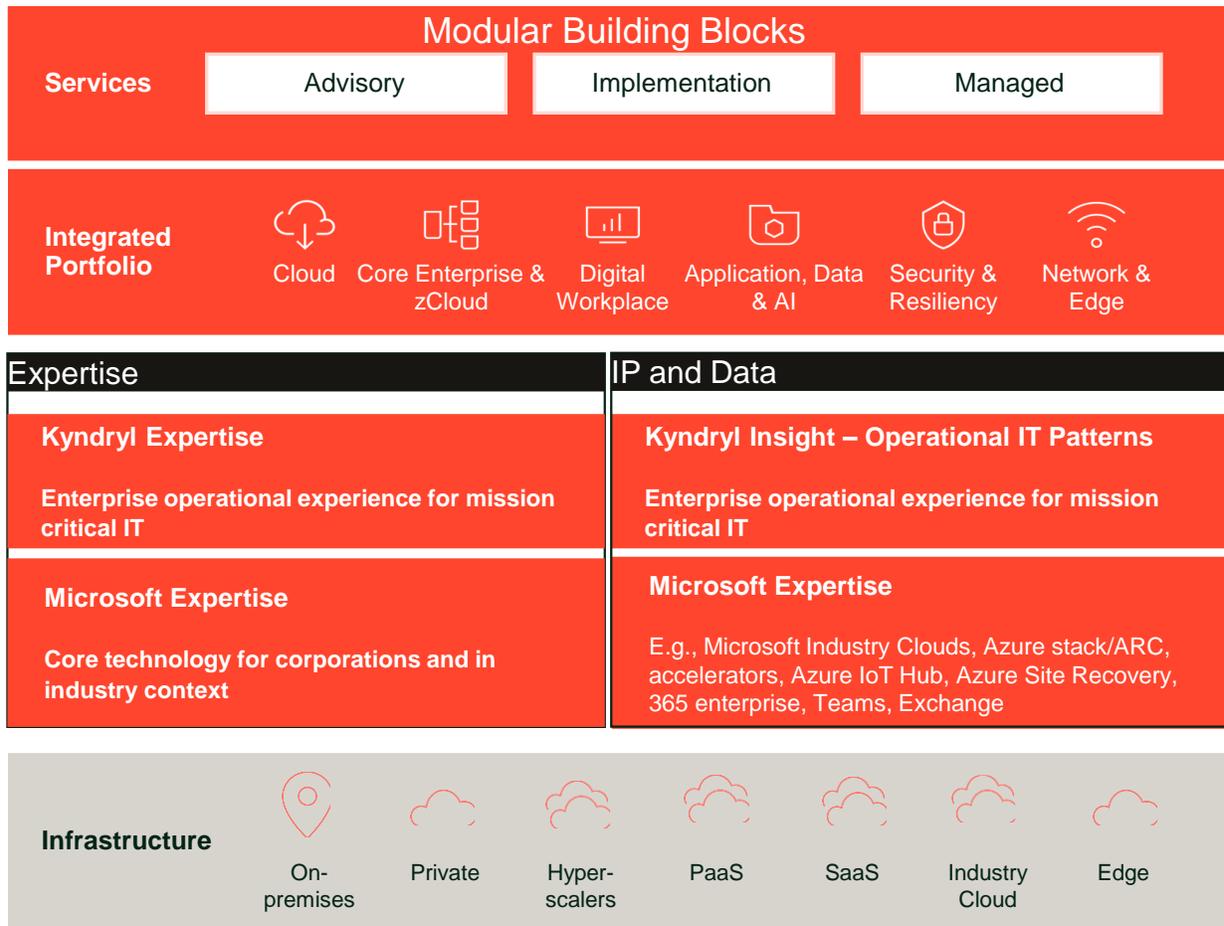
Kyndryl-Azure Synergies and Joint Solutions

Figure 2 provides a detailed view of the synergies and joint solutions that Kyndryl and Azure are providing enterprises in supporting hybrid multiclouds:

- **Kyndryl.** Kyndryl focuses on supporting mission-critical and complex hybrid multicloud environments that leverage unique IP and data resources while providing expertise in areas such as orchestration, engineered services, digital provisioning, operations, and management. Kyndryl also supports key areas such as mission-critical infrastructure modernization on Azure, cyber-resiliency, SAP, enterprise applications on Microsoft Azure, and modern work. This expertise also includes optimizing IBM Z/i investments while providing cloud solutions for developing new and agile applications.
- **Microsoft.** Microsoft is focused on providing its enterprise public cloud and hybrid platform called Azure, utilizing its expertise in its Azure Platform services that includes its private cloud Azure Stack, modern work capabilities, and industry perspectives (e.g., healthcare, manufacturing, retail, FSS).

FIGURE 2

Kyndryl and Azure Partnership



Source: Kyndryl, 2022

Strategic Investments and Capabilities

To meet the changing needs of clients, Kyndryl is making the following strategic investments that can help ensure provisioning of operational excellence in managing hybrid multiclouds while utilizing the Azure cloud platform:

- **Management platform.** Kyndryl has developed and continues to invest in Kyndryl Bridge, which can support enterprises in designing, developing, deploying, and managing any IT and cloud resource including hyperscaler platforms. This management platform can also provide enterprises with the means of ensuring operational excellence utilizing new capabilities including DevOps, CI/CD, AIOps, and financial management via use of financial operations (FinOps), all while supporting the different needs of end users (e.g., developers, IT operations, CXOs).
- **COEs.** By investing in its 19 customer innovation centers, Kyndryl provides a means of close collaboration between Kyndryl experts and its clients for the purpose of developing and testing

new solutions and capabilities used in hybrid multicloud environments. These centers are strategically located worldwide from the United States to Eastern Europe and India to support clients looking to work locally and in a collaborative environment.

- **Talent and certifications.** Kyndryl continuously invests in developing its pool of talent as reflected through more than 31,000 vendor-recognized certifications in VMware, Cisco, Red Hat, Azure, AWS, and more; more than 40,000 cloud consultants; and more than 24,000 certified experts globally across multiple clouds (AWS, Azure, Google, VMware, Red Hat, IBM Cloud).

CHALLENGES AND OPPORTUNITIES

To meet strategic business and IT objectives, enterprises increasingly are looking to leverage the value of hybrid multiclouds through the use of managed cloud services. However, in utilizing managed SPs to support these environments, firms indicate that there are some strategic areas that these providers need to address, in addition to the requisite need for managed SPs to provide client referrals to prospective customers as proof points. These include the following:

- **Implementing a transformative environment.** Ensuring that hybrid multicloud environments will meet client needs requires managed SPs to offer a robust framework for migrating IT assets to the cloud that incorporates advanced processes (e.g., DevOps, CI/CD, SRE) and new technologies (e.g., containers, microservices) along with standardized templates and blueprints. Managed SPs also need to utilize advanced automation (cognitive/AI/ML) as part of a multicloud management platform that can enable rapid migration and modernization, resulting in the ability to continuously adapt to hybrid multicloud capabilities based on changing market dynamics.
- **Controlling cloud and IT resources.** Critical to ensuring operational excellence is the need for managed SPs to implement a robust governance structure that utilizes a multicloud management platform. This platform must be able to not only manage across any set of IT and cloud resources including hyperscaler partners but also provide sophisticated analytics that can help enterprises control consumption of cloud services along with noncloud technology environments, ensure quality of services that meet SLAs, and enable effective FinOps.
- **Access to multiple public cloud providers.** Optimizing the value of hybrid multiclouds requires managed SPs to ensure enterprises have access to multiple public cloud providers in order that firms can leverage best-in-class capabilities, have the capacity needed to support scalability requirements, and can mitigate operational risks by minimizing risk of downtime.
- **Ensuring data integrity.** The complexity of ensuring the integrity of data and information requires managed SPs to implement a wide array of capabilities. These capabilities must span implementing advanced managed security services, use of landing zones/hosting centers that are localized to support meeting data sovereignty requirements, data storage management, and backup and recovery. In addition, managed SPs need to have the requisite industry knowledge required to effectively architect the optimal environment to ensure that data is secure and unaltered.

SUMMARY AND CONCLUSIONS

Enterprises are facing increasing challenges in managing highly complex hybrid multiclouds as they expand the breadth of technologies, processes, and use of hyperscalers they need to support their businesses. To help manage this complexity, enterprises are turning to managed SPs. However, to

ensure that managed SPs can meet hybrid multicloud requirements, firms need to consider the following:

- **Developing tailored solutions.** The highly competitive nature of markets today requires differentiating goods and services. Enabling enterprises to achieve the right differentiation requires managed SPs to help tailor the use of hybrid multicloud capabilities to specific business and IT requirements. Consequently, tailoring hybrid multiclouds requires managed SPs to have an extensive portfolio of capabilities that incorporate new skills, technologies, and processes; support any type of cloud (private, public, hybrid), cloud platform (IaaS, PaaS, SaaS), and hyperscaler; enable access to partnerships with technology vendors; utilize unique IP; and provide the full life cycle of services.
- **Implementing robust governance.** Ensuring that enterprises can support their business and IT needs while utilizing managed cloud services for hybrid multiclouds requires implementing a robust governance structure. The governance structure needs to support enterprises in optimizing cost management and asset utilization, meeting compliance and security requirements, and aligning usage by personas (e.g., IT, LOB, CXO, partners). As part of this structure, managed SPs need to utilize a multicloud management platform that can ensure operations and performance management (SLAs), implement a framework for data management and sovereignty, define policies/metrics in utilizing cloud, and develop standardized processes in managing IT.
- **Supporting global delivery with local capabilities.** Firms need the ability to do business anywhere in the world while also having the ability to localize their requirements. Increasingly, this includes provisioning hybrid multicloud services to meet government regulations regarding data sovereignty and industry regulations as well as adapting to the greater volatility of international trade, global supply chains, and buyer behavior. Consequently, managed SPs need to have access to a global footprint of infrastructure capabilities that can provision any type of technology, whether legacy (noncloud) or cloud, by specific location while simultaneously supporting a firm's IT requirements, meeting SLAs, and delivering on strategic business objectives.

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Global Headquarters

140 Kendrick Street
Building B
Needham, MA 02494
USA
508.872.8200
Twitter: @IDC
blogs.idc.com
www.idc.com

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