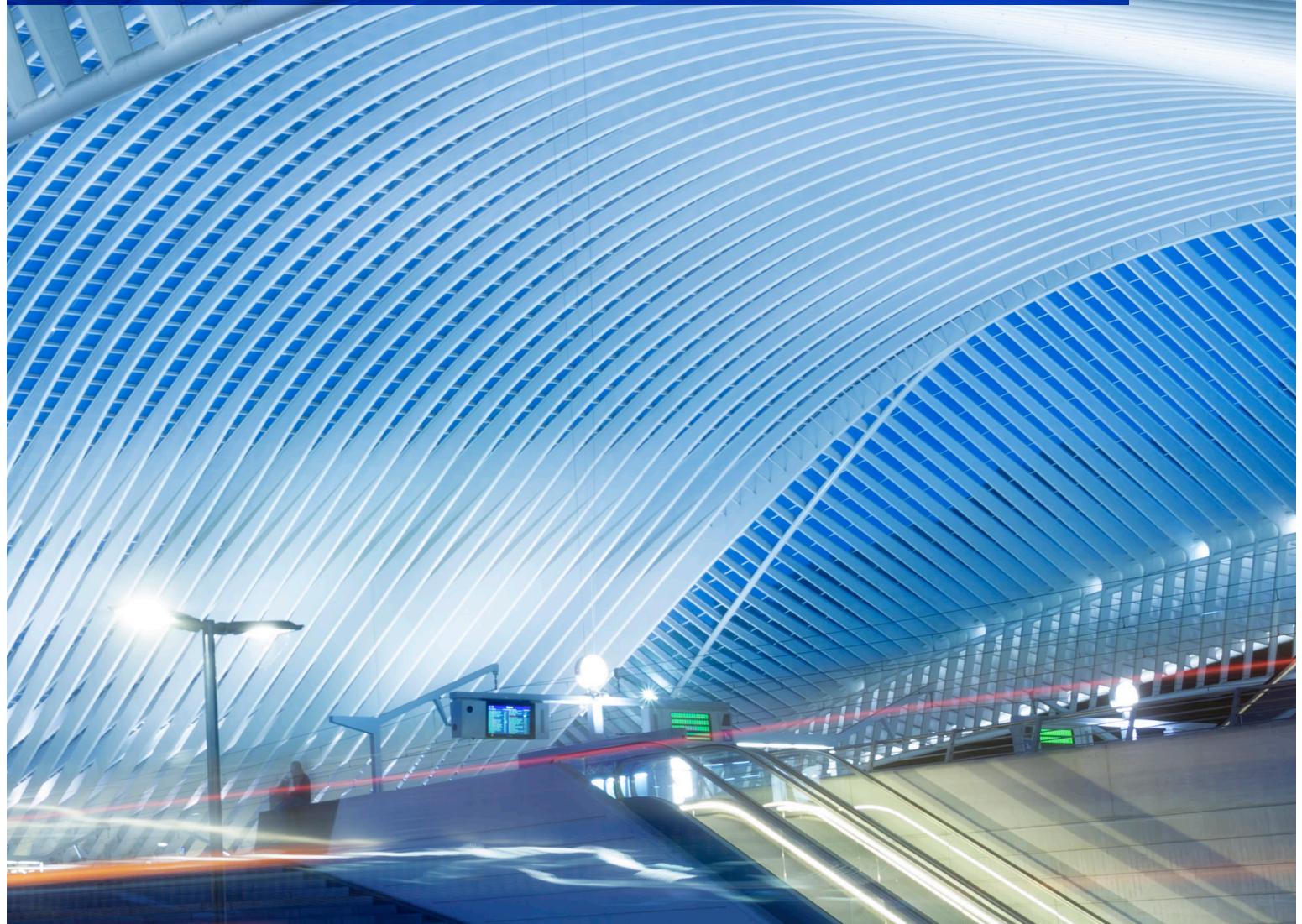


Accelerate your digital transformation:

the enterprise guide to hybrid cloud



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What you will learn

This e-book provides an in-depth look at what enterprise-level IT decision makers need to know about Microsoft's consistent hybrid cloud, and why a hybrid cloud model can be critical for your digital transformation. Key statements at the beginning of each chapter summarize the takeaways.

Hybrid cloud and your digital transformation

As an IT decision maker, you're on the front lines of digital transformation. The technology solutions you implement must support the overarching business goals of your organization, protect your mission-critical data across multiple operating systems, and at the same time, provide infrastructure services that support open technologies for your increasingly mobile workforce—all while staying within your budget.

It's no small task.

Enterprises and large organizations increasingly turn to the cloud to achieve essential flexibility and efficiency. However, it's important to leverage existing infrastructure investments as much as possible. A hybrid cloud approach offers the best path to the cloud, and a way to optimize your existing assets.

Cloud trends to watch

- 71 percent of enterprises have adopted hybrid cloud, up from 58 percent, year over year.¹
- 59 percent of IT professionals believe their data environment is safer after investing in cloud services.²

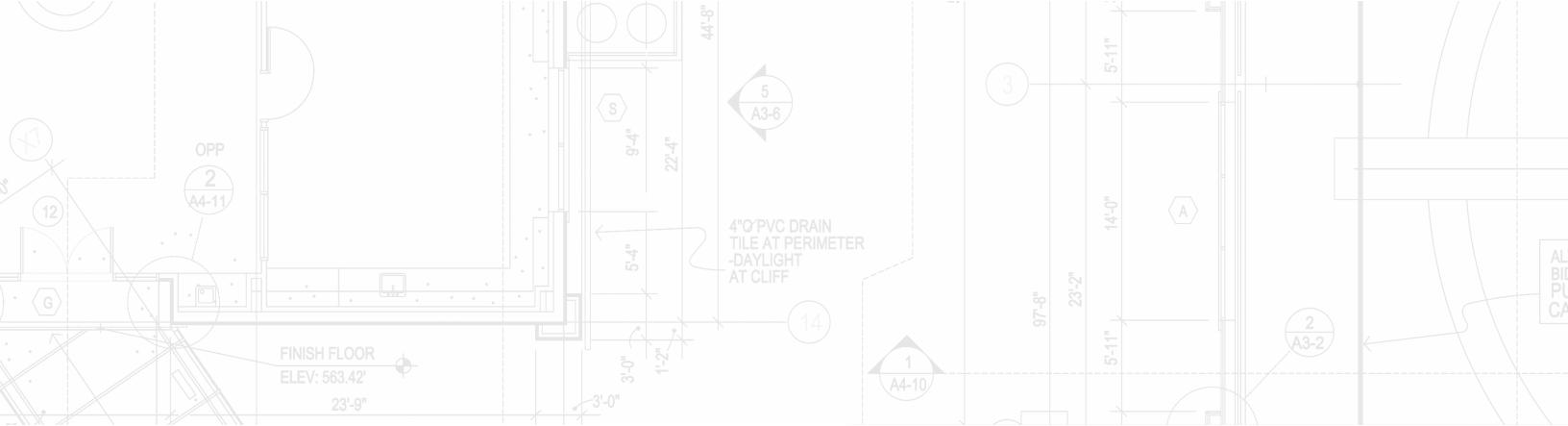
For many industries, including banking, financial services, and healthcare, on-premises operations aren't going away anytime soon—if at all—so optimizing existing technology assets and investments makes sense both economically and from an innovation perspective. Every business is different, and hybrid cloud gives you the flexibility to choose the best location for each application, moving workloads to the cloud on demand.

A cloud model means that businesses are free to choose the balance between on-premises, public, and private cloud that best meets their unique

security, compliance, and operational requirements. In the hybrid cloud, you're able to keep critical data, applications, workloads, and services on-premises, if you choose, and scale to use resources in the cloud on an as-needed basis.

A consistent hybrid cloud environment also helps IT administrators manage, assess, and mitigate security threats. And, granular controls and single sign-on reduce the risks associated with multiple users, devices, apps, and platforms.





5 elements of digital transformation

Enterprise computing has moved beyond data storage and reporting to a **strategic function** that introduces new ways of working internally, and with external partners and customers.

1. IT is a force for innovation and collaboration
2. Modern IT leverages existing assets and investments, integrating the power of flexible cloud technologies
3. Hybrid cloud enables faster data processing, application development and implementation
4. Enterprises can quickly scale and respond to evolving business needs
5. Managing all data resources from a unified platform allows businesses to unlock new opportunities and position emerging/next gen technologies, such as AI, machine learning, and the Internet of Things (IoT)

The move to hybrid cloud is not just a technology play. When viewed as part of an organization's digital transformation strategy, it becomes obvious that a hybrid cloud model plays a key role in modernizing IT operations, and achieving cost efficiencies.

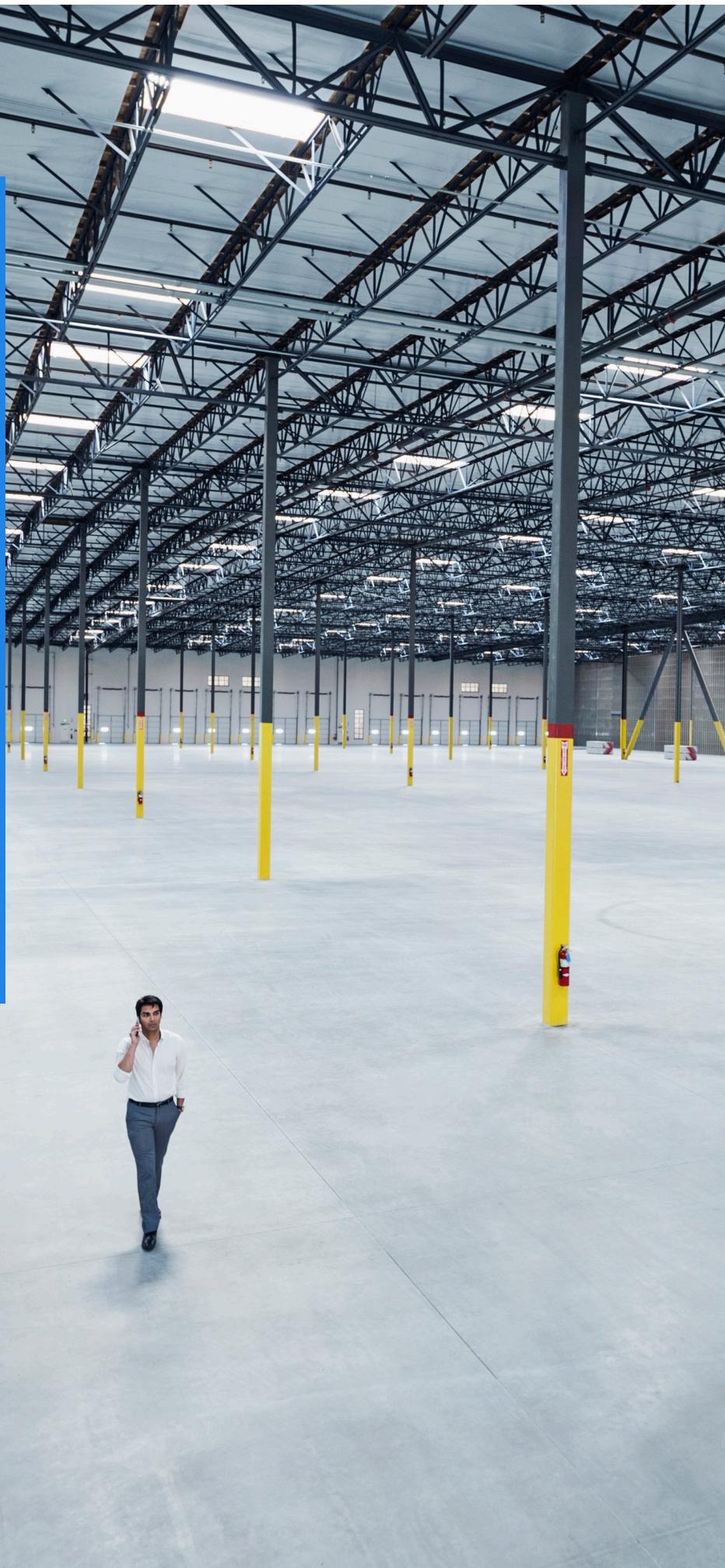
Cost is an important consideration for IT decision makers, and driving ROI is always a top-of-mind concern. Moving on-premises workloads to the cloud, where you only pay for what you use, delivers significant savings. Using on-demand resources in the cloud, you can leverage the power of the cloud and provide services that complement your existing on-premises datacenter. With an investment in a hybrid cloud model, infrastructure spend shifts from capital expenditure to operating expense, freeing up resources for other projects that support the business.

Most organizations recognize that moving to the cloud is fundamental to achieving digital transformation. This e-book highlights the benefits of a hybrid cloud model, and helps you understand how to evaluate the key elements of a consistent hybrid environment.

Ten years ago, only **40%** of CIOs were involved in strategic planning. Today, CIOs are considered integral members of the C-suite.³

Chapter 01

Migrating to the cloud isn't as overwhelming as it might first appear—and it doesn't need to be, with a strategic roadmap that outlines your priorities.



The importance of hybrid cloud consistency

Key takeaway

A consistent hybrid cloud ensures that IT managers, developers, and users are able to work seamlessly across platforms in a fully integrated environment.

The size and complexity of your applications, hardware platforms, and the operating systems you're using are all factors that impact your migration strategy. Your migration to the hybrid cloud is also a cultural shift. It's about more than technology, and you need to consider your users, and plan for inevitable adjustments to roles, process, and governance.

But as many enterprises have learned, the benefits of hybrid cloud far outweigh the challenges. Once you've adopted an integrated hybrid cloud model, you'll be able to manage and optimize workloads holistically.

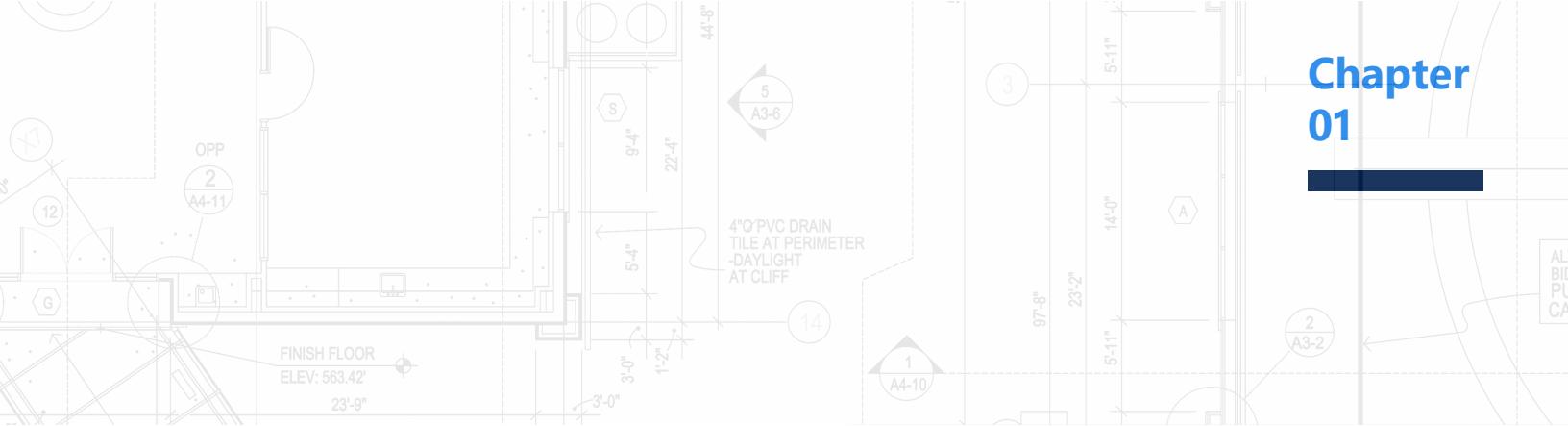
The visibility and consistency you achieve through a hybrid platform is key to hybrid cloud success. Without a comprehensive solution, there are more moving parts to manage. In fact, a fragmented approach to hybrid cloud elevates risk for a number of reasons.

In today's cost-conscious IT environment, inefficiencies are expensive, and difficult to justify over time. And organizations that rely on multiple hybrid cloud vendors risk significant complications, due to:

- Different identity management systems
- Different management and security systems
- Different data models and support for different developer experiences

Rather than achieving the benefits that a hybrid cloud can provide, you've created what is often an unmanageable level of complexity.





Conversely, a consistent hybrid cloud experience simplifies your journey to the cloud and meets your business's requirements. Using uniform technologies across identity management, application development, data management, and security, developers and IT professionals aren't constrained by the limitations imposed by disconnected systems.

But basic connectivity isn't enough. In order to support the unique needs of a modern enterprise, IT departments need a *complete, integrated, and consistent* environment that supports both productivity and usability.

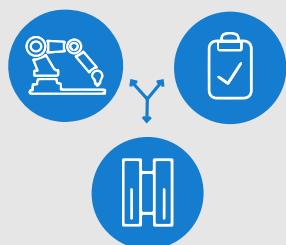
To reap the benefits of the hybrid cloud environment, IT decision makers should carefully evaluate their requirements in relation to the four key areas detailed in the following chapters.

A hybrid cloud must provide consistency across four key areas: identity; management and security; data platform; and development and DevOps.

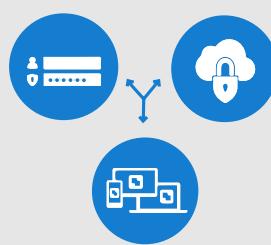
Azure Hybrid Use Benefit



The four pillars of hybrid cloud consistency



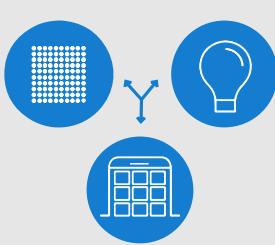
Common identity



Integrated management and security



Consistent data platform

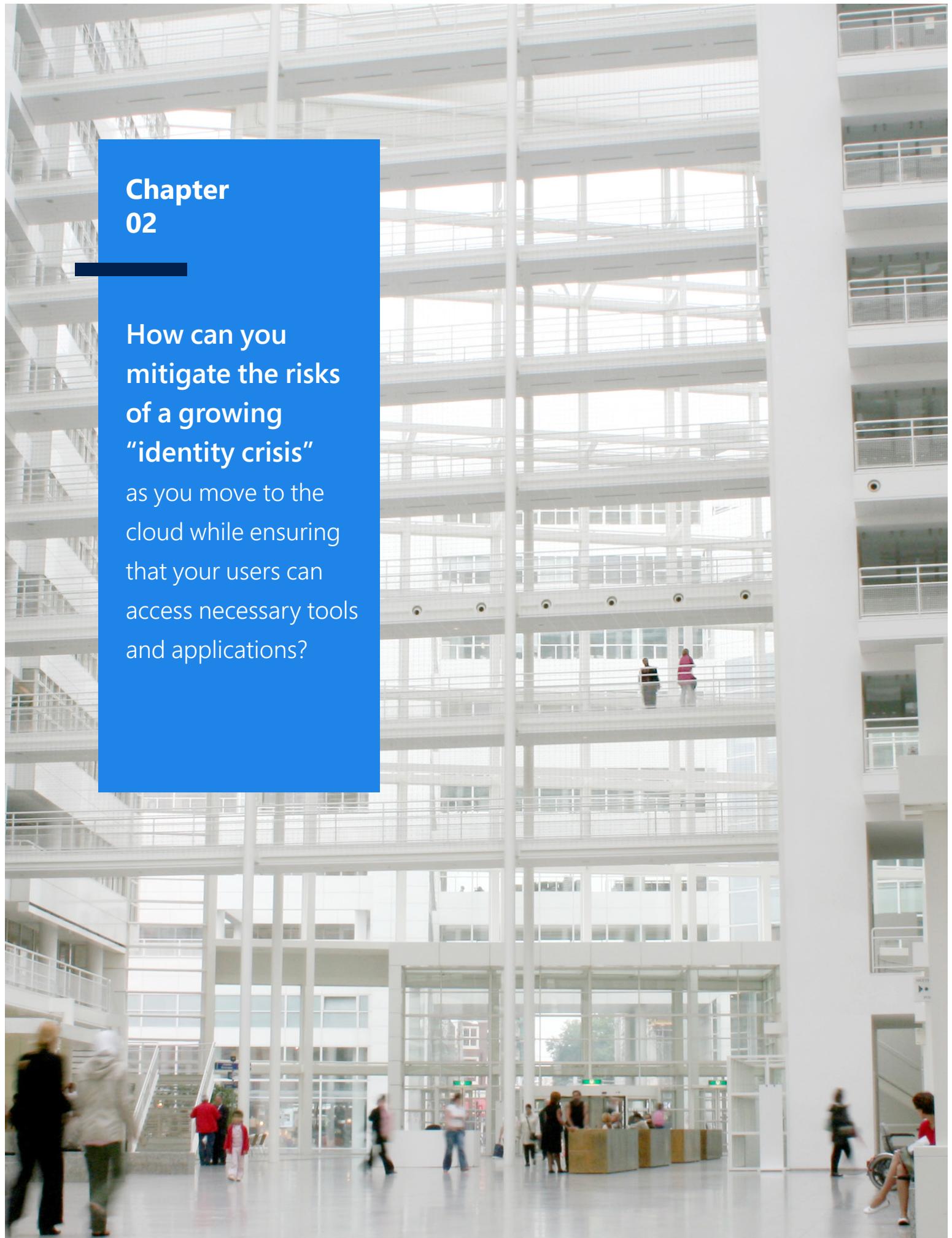


Unified development and DevOps

Chapter 02

**How can you
mitigate the risks
of a growing
“identity crisis”**

as you move to the
cloud while ensuring
that your users can
access necessary tools
and applications?



How common identity protects your users and your enterprise

Key takeaway

Single sign-on to cloud and on-premises applications simplifies user experience and provides protection for corporate assets and information.

In our increasingly BYOD-centric world, most users would agree that multiple devices, too many logons, and too many passwords lead to security fatigue—a real on-the-job hazard for your employees, and a security threat to your enterprise.

Ideally, users should have an identical and consistent experience that doesn't require separate credentials, regardless of whether they access applications on-premises or in the cloud.

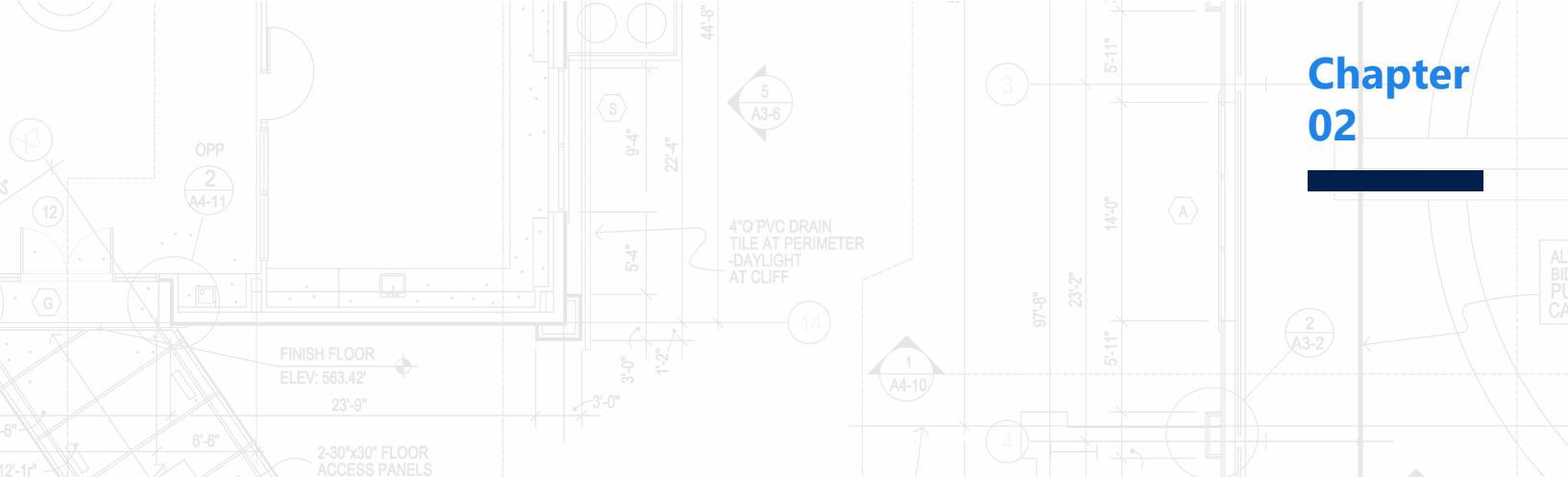
For administrators, the ability to *manage access* to applications is critical to providing a consistent cross-platform experience. With a unified view of all users, from employees to supply chain partners, it's possible to provide appropriate access to all-important apps and tools, and deprovision as necessary.

Regardless of whether your users are working on iOS, Mac OS X, Android, or Windows devices, they should be able to access their applications and be guaranteed that they will have the same secure and rich experience—a critical requirement on your journey to digital transformation.

90%
of CIOs report that upgrading or simplifying the user experience is a key concern.⁴

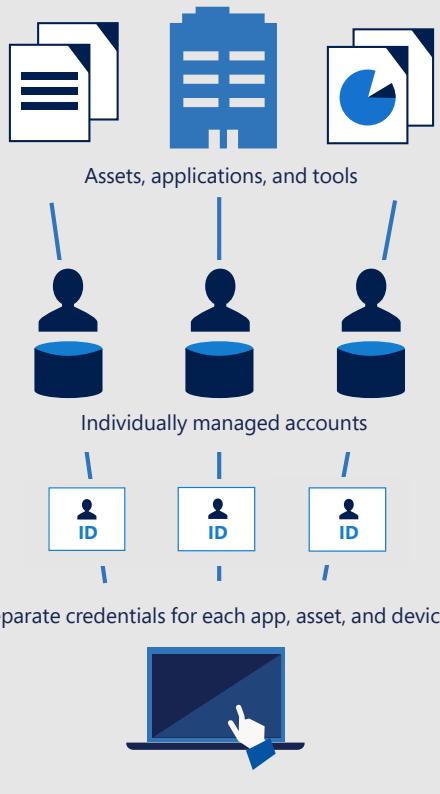
Recognition:
[Gartner's 2016 Magic Quadrant for Identity and Access Management as a Service, Worldwide](#) named Microsoft a leader, positioned the furthest for complete vision in the leaders quadrant.⁵

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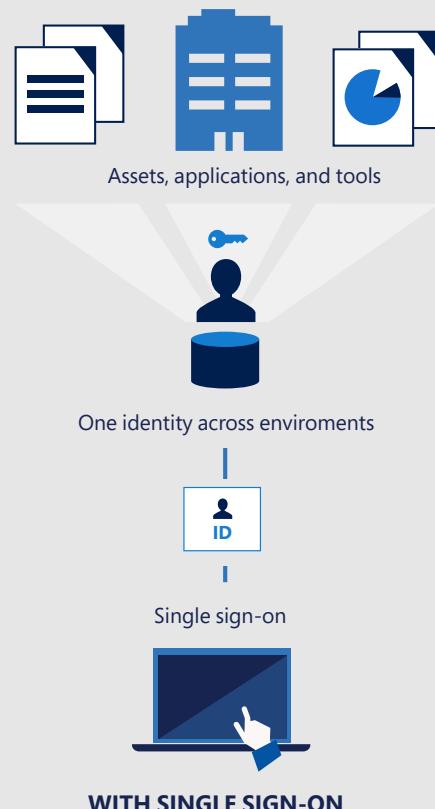


Protect your users and your enterprise

Single sign-on makes it simple for users to safely access the applications and assets they need, on-premises and in the cloud.



Without centralized access to enterprise systems, users are required to enter separate passwords for each application and asset.



Single sign-on allows users to authenticate with a single enterprise account. Administrators can manage security and governance controls so users can access what they need—with flexibility to adjust those permissions without affecting the user experience.

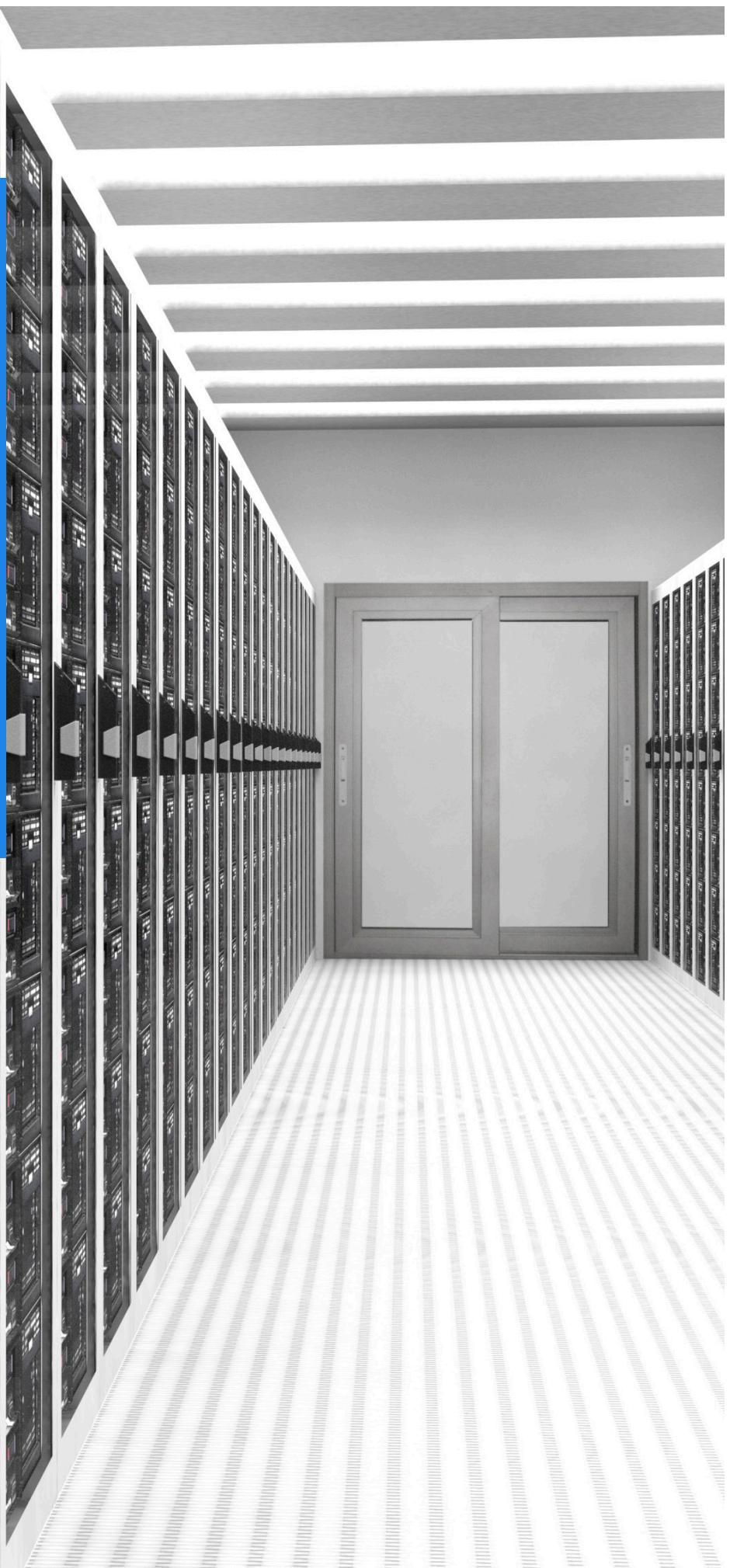
Learn more about identity and access management tools in the cloud



Chapter 03

**Analytics has
become
increasingly
important**

as companies look
to stay competitive.



Leverage your data assets in powerful new ways

Key takeaway

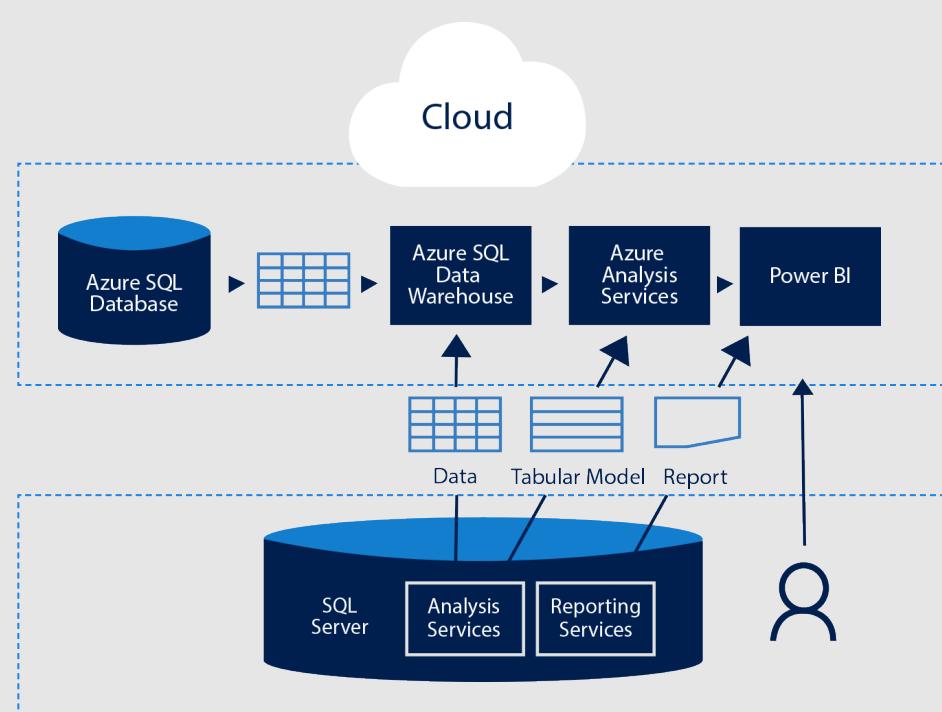
When you can distribute data seamlessly between cloud and on-premises, you're able to realize the benefits of granular analytics, visualizations, and deep learning.

Data coming in from external sources must be able to live with on-premises corporate data. A hybrid cloud environment makes this possible. What this looks like at the operational level varies by organization: every organization manages its data differently, and there isn't a one-size-fits-all approach to data management.

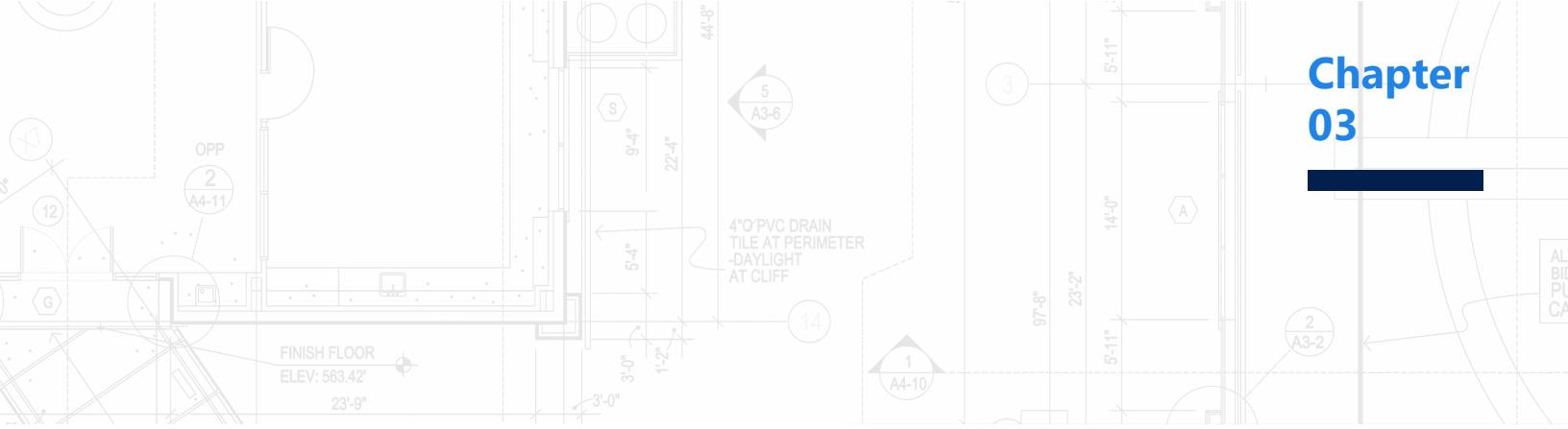
But regardless of where your data resides, your team should be able

to use the same tools, whether on-premises or in the cloud.

A consistent hybrid cloud model allows users to work with both operational and analytical data and provides the same services on-premises and in the cloud for data warehousing, data analysis, and data visualization.



A consistent hybrid cloud allows you to visualize and analyze data across platforms. Azure hybrid cloud provides common tools that ensure you can leverage all of your data, seamlessly and efficiently.



Beyond operational data, Microsoft's hybrid cloud data platform includes consistent services for analyzing and visualizing on-premises and cloud data.

- Load data from both on-premises SQL Server database and Azure SQL database.
- Work with both relational and unstructured data.

- Analyze data with your existing skills and familiar tools.
- Visualize data with cloud-based Power BI—a suite of business analytics tools that works with data from many different sources.

The best cloud vendors provide deep—and consistent—functionality both in the cloud and on-premises.

With a platform that allows you to work with data in many different ways, seamlessly distributing data between both environments, your organization can leverage powerful analytical and operational tools, create and scale resources as needed, handle high availability, and at the same time, optimize for costs.



Learn how to enrich your data assets using powerful analytics available in the hybrid cloud



Hybrid cloud in the real world

Willis Towers Watson (WTW) is in the business of analyzing risk, pricing policies, and providing consulting and software solutions to its insurance company clients.

The opportunity

WTW was looking for a new way to exploit driver data to create a marketable, usage-based insurance product (UBI) that would help price policies more competitively and more profitably.

The challenge

Prior prototypes were created using parallel database appliances, but scaling to millions of vehicles went beyond the capabilities of a conventional database.

The solution

The search for a solution led the company to select Azure (which would also support an existing service, Risk Agility FM). Compatibility and interoperability with customers' systems was also a key consideration in selection of Azure.

The results

The implementation was a success. With an Azure cloud solution, WTW was able to go beyond what was possible on-premises.

- Competitive advantage achieved by developing a powerful, reliable, scalable solution.
- Savings in capital and operating costs coupled with the ability to provision dynamically to meet fluctuations in demand without additional hardware purchases and time-consuming deployment processes.
- Broadened market opportunities. UBI is now within reach of many insurers who didn't want to build it on their own, or who couldn't afford to do so.

At a glance

A player in a conservative industry embraces a Microsoft Azure hybrid cloud solution that disrupts standard approaches to auto insurance—and delivers a forecasted 40 percent savings.

"We run analytics that are more sophisticated—and more predictive—than those of competitors, which make them more valuable to insurers. Azure is crucial to our ability to do this."

—Andy Lingard, Global Leader of General Insurance Software Development, Willis Towers Watson

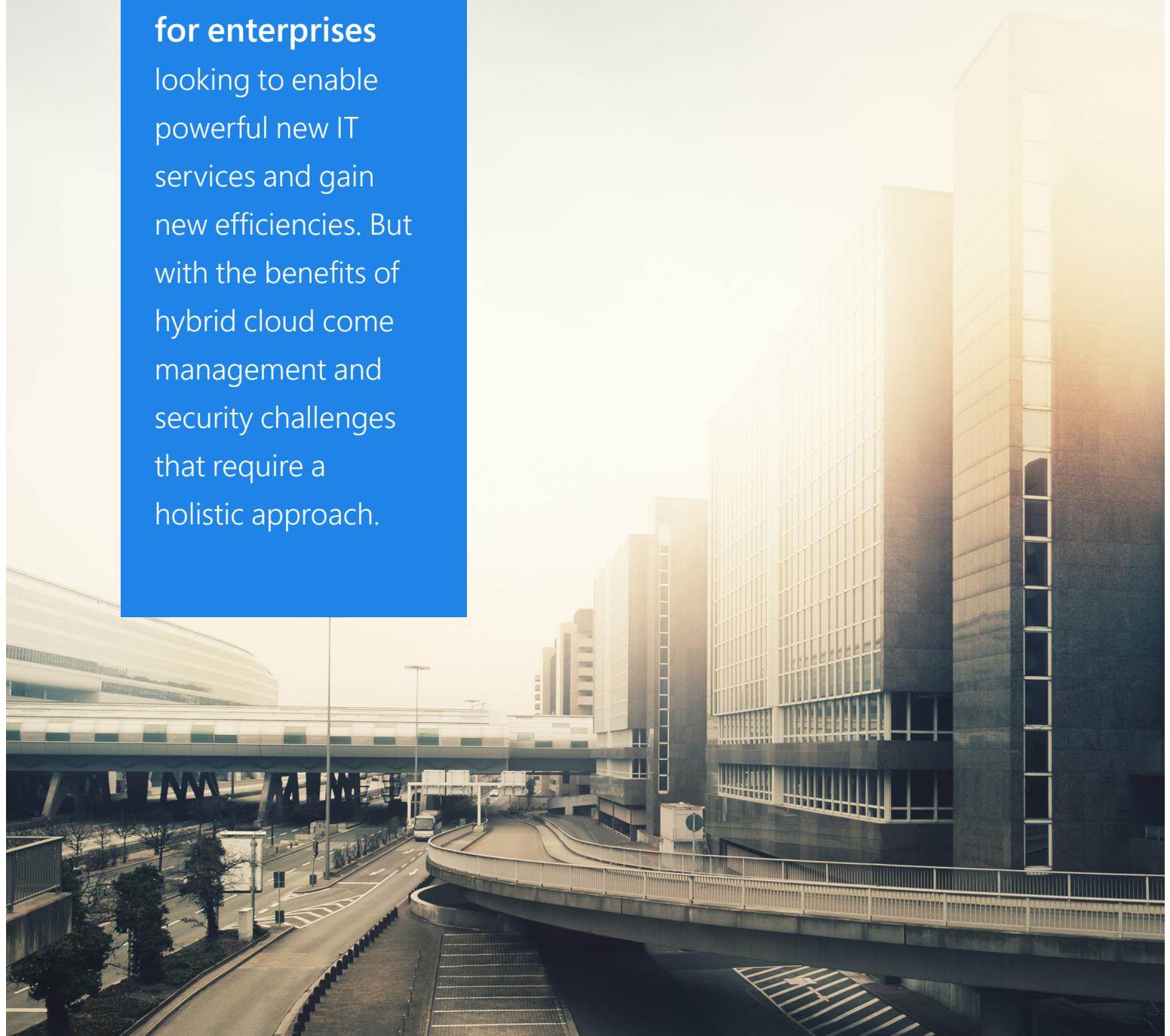
Read the case study



Chapter 04

Hybrid cloud changes the game for enterprises

looking to enable powerful new IT services and gain new efficiencies. But with the benefits of hybrid cloud come management and security challenges that require a holistic approach.



Ensuring visibility and control in the hybrid cloud

Key takeaway

End-to-end visibility and control is vital to a consistent hybrid cloud environment.

Microsoft offers built-in management and security capabilities that include an integrated set of tools for monitoring, configuring, and protecting your hybrid cloud. This end-to-end approach to management specifically addresses four real-world challenges facing organizations considering a hybrid cloud solution.

A closer look at Azure security and management services

Insights & Analytics →

Monitoring activity is a critical part of hybrid cloud management, and to do it, you need full visibility of both your on-premises and cloud datacenters. With a consistent, fully integrated solution, you can use the same tools to find and fix errors faster—whether the problem database operates on-premises, on a hosting provider, or in the cloud.

Protection & Recovery →

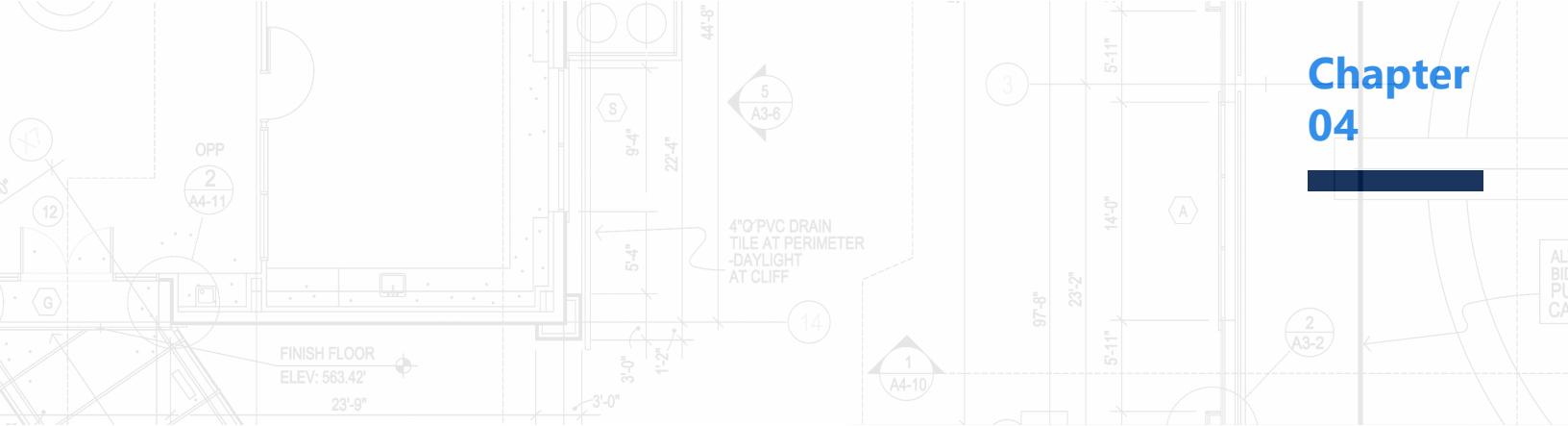
The cloud offers an efficient, cost-effective choice for data backup and recovery. Most cloud platforms let you run third-party software for backup and disaster recovery, but with Microsoft

these services are fully integrated and easy to turn on, which means you don't have to install and manage a separate product in the cloud.

Automation & Control →

If you are managing multiple workloads in the cloud, automation can give you the control you need across hybrid environments. Streamlining workflows and creating operational efficiencies make sense from both a business and a technology perspective.





Using automation, admins can create PowerShell scripts (runbooks) and operationalize common processes, from resetting passwords to setting up virtual machines. By proactively creating runbooks and configuring them to execute when alerted, you gain actionable insights that can save valuable time, and money.

Security & Compliance →

In a hybrid cloud environment, IT needs a coherent, unified view of the security

state of their resources. This central source of data allows administrators to understand their vulnerabilities—and respond quickly.

To deliver this ability, Microsoft provides an integrated suite of tools that are intuitive enough for administrators to use without requiring specialized security credentials.

With one click, administrators can correct configurations on virtual networks or enable encryption on SQL

databases. Troubleshooting is easier because admins can receive specific recommendations and guidance on how to fix security vulnerabilities, tapping into the power of machine learning, advanced analytics, and threat intelligence.

Four challenges in the hybrid cloud



combined on-premises infrastructure and cloud resources

of both cloud and on-premises resources

tasks, such as responding to alerts

the larger surface area of the hybrid cloud against cyberattacks

Microsoft's journey to the cloud

Microsoft Enterprise Commerce IT (ECIT) manages the entire commercial licensing operation. ECIT performs a business-critical role within Microsoft and generates approximately 47 percent of the company's annual revenue.

The opportunity

When the Microsoft Enterprise Commerce team needed a flexible, scalable solution to support a massive user base, they selected Azure to support a cloud-first, mobile-first business model.

The challenge

Moving toward providing services and devices in addition to software licenses, Microsoft needed to rearchitect its volume licensing. The requirements for the new platform were based on a number of factors, including different software versions serving different user bases, seasonal fluctuations in volume, scalability for future growth, and internal cloud adoption goals. Of critical importance was a lightweight, low-touch solution that would be consumption-based, rather than license-based.

The solution

The Microsoft Enterprise Commerce team ultimately determined that Azure

fulfilled scalability and agility needs for the short term and long term. Rearchitecting for Azure led the team to choose the platform-as-a-service (PaaS) model for all new development. Developers leverage PaaS out-of-the-box products for elasticity, redundancy, resiliency, and a better user experience, with the additional benefits of access to capacity on demand, and reduced application maintenance costs. The new platform puts core foundational components in the cloud, including authentication and authorization, caching, logging, and messaging.

The results

The initial hybrid cloud implementation was a success. The team anticipated future benefits, including:

- Using capacity only as needed to help manage seasonal traffic fluctuations
- Hardware abstraction and standardization
- Consolidating infrastructure and getting servers out of locally managed datacenters
- More agile business continuity and disaster recovery
- Reduced management costs for patching and platform upgrades
- Even better user experience

At a glance

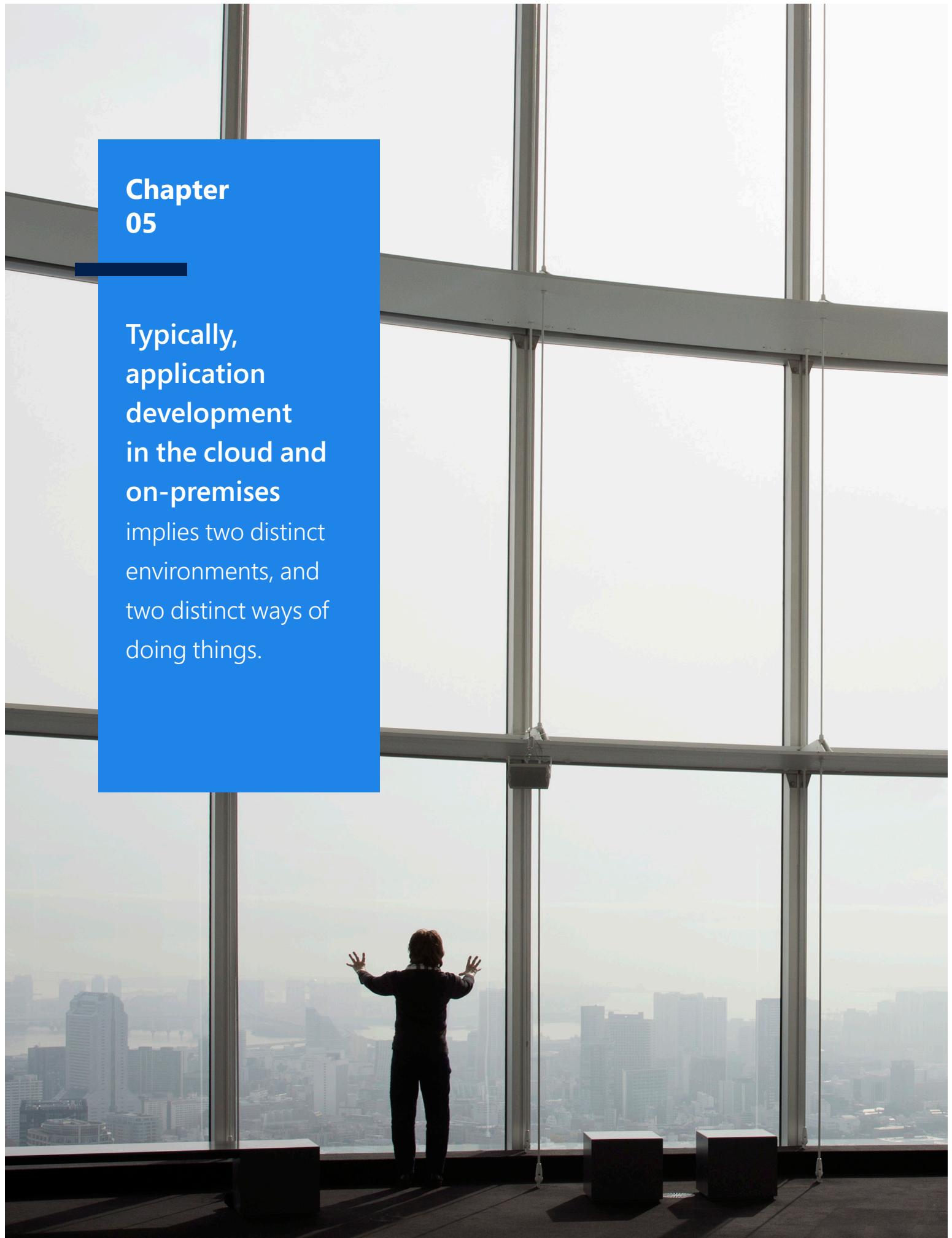
Licensing is complex, and scaling computing systems to accommodate growth and change is daunting—even for a global technology company.

Read the case study



Chapter 05

**Typically,
application
development
in the cloud and
on-premises**
implies two distinct
environments, and
two distinct ways of
doing things.



Build a common environment for app development

Key takeaway

"Build once, deploy everywhere" describes how today's developers want to work. A common approach to building applications—and full flexibility to deploy in the cloud or on-premises—makes it possible.

What works in one environment is not guaranteed to work in the other: applications developed in the public cloud, for example, aren't always built with the same languages that are available on-premises.

The business benefits of being able to deploy anywhere are significant. The ability to use existing skill sets means that you don't need to hire an extra team of developers, or incur additional costs that are typically associated with developing and translating to different languages.

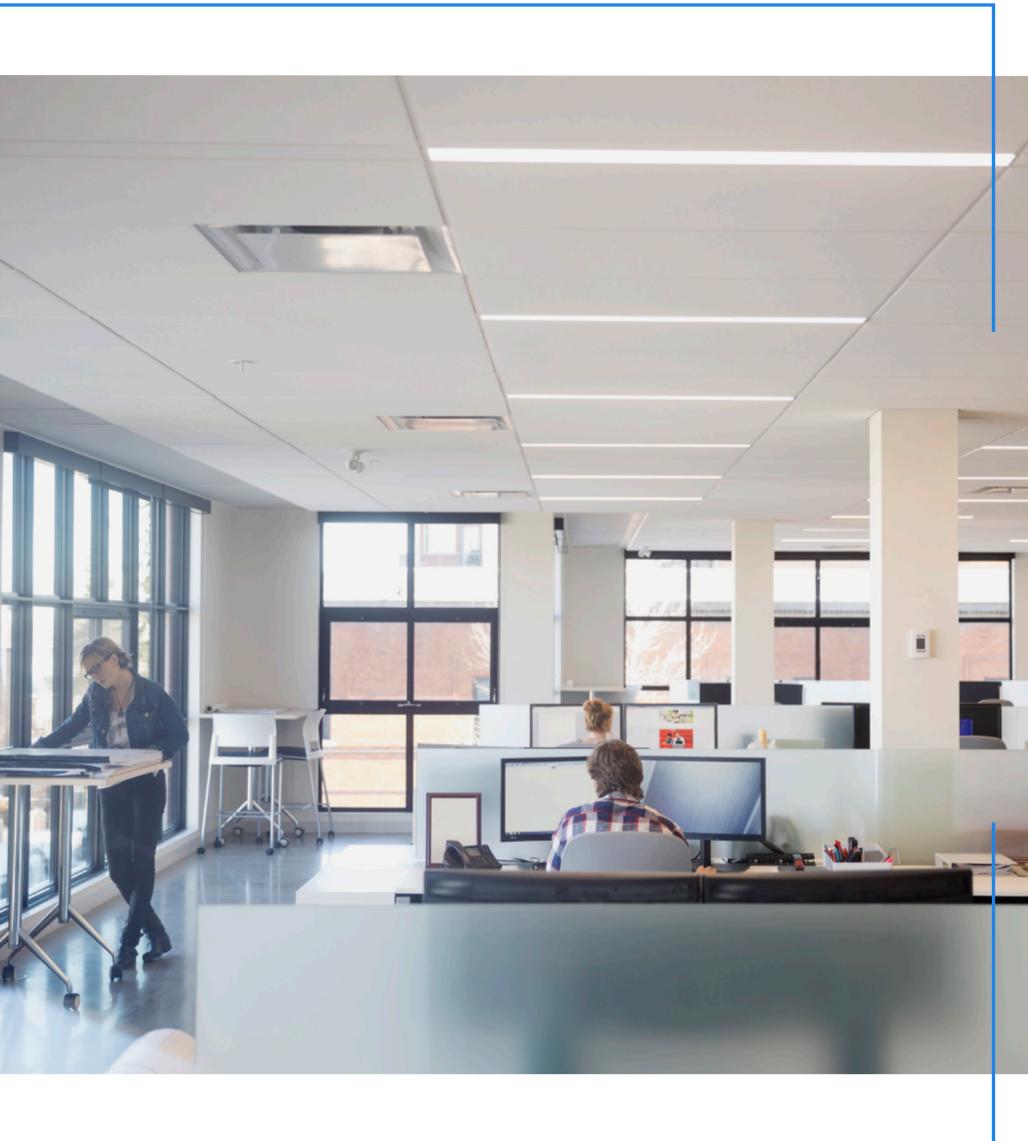
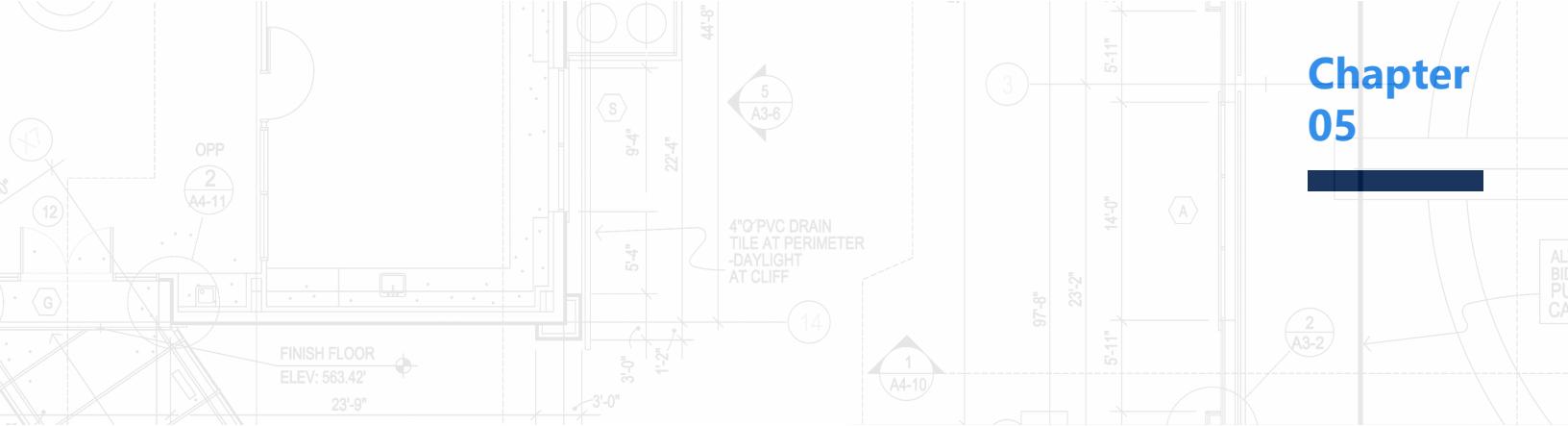
It's also a challenge to provide up-to-date platform technologies for applications that connect to the cloud, or that need to run closer to their users. Edge computing—that is, computing that happens closer to the source of data, such as IoT devices—is easier in a hybrid environment, where development is the same whether on-premises or in the cloud.

Rather than trying to stretch or modify existing on-premises technologies to function in the cloud, a hybrid model enables developers to build and

deploy modern applications in both environments in a familiar way.

Moving applications between on-premises and the cloud is also straightforward. You can choose where to deploy an app based on your needs, and you aren't locked into either cloud or on-premises. Because the cloud supports up-to-date technologies, your on-premises development projects aren't limited to older technologies.





From a resourcing perspective, organizations can mitigate staffing issues while enhancing productivity because development skill sets are the same for both environments.

Consistency across the cloud and on-premises means that your DevOps team can build applications that run in either environment and easily deploy to the right location. Templates can be reused across the hybrid cloud as well, which can further simplify DevOps processes.

In a hybrid world, consistency matters. For DevOps teams, it's fundamental.

Learn more: Five Reasons to Run Your Microsoft Apps on Azure (on demand webinar)



Conclusion

Choosing the right hybrid cloud solution is an important step in your digital transformation.

The hybrid platform is a strategic choice for forward-leaning organizations that are looking for a long-term, powerful solution to propel innovation, flexibility, and control across their on-premises and cloud environments.

A hybrid cloud model delivers efficiency, at scale. The hybrid cloud leverages your existing investments in traditional on-premises datacenters and provides the modern infrastructure that will enable your digital transformation.

As you and your organization begin—or continue—your journey to the cloud, compare and evaluate vendor offerings based on the four key components discussed in this e-book:

- Common identity
- Integrated management and security
- Consistent data platform
- Unified development and DevOps

With deep expertise, and a long-term vision and commitment to hybrid cloud, Microsoft is ready to help you identify, plan, and execute on migration opportunities as part of a larger hybrid cloud strategy.

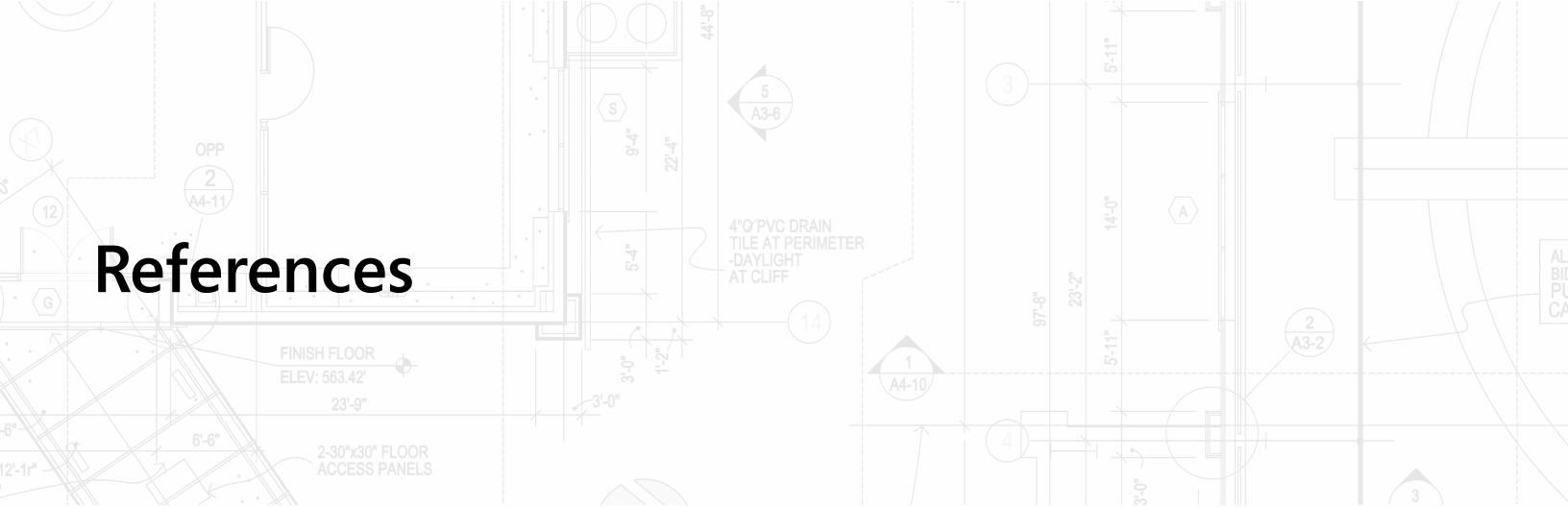


Next steps

Learn more about hybrid cloud



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