

Cloud migration has become a process that nearly every business will undertake to become or remain competitive. But we can't lose sight that the cloud, in all of its permutations and opportunities, is the harbinger of improved and sustainable business outcomes that will help businesses survive and thrive as we move forward. We've found 93.7% and 88.4% of organizations see cloud as critical to meeting their immediate and future business needs respectively, according to our [2021 Hybrid Cloud Report](#).

Rather than cloud migration being a means to an end, it's the means to countless opportunities. The process can be straightforward or complex depending on the places you want your cloud journey to take your business. The first part of that complexity comes in the endless, confusing signs along the journey of terms and processes, making it difficult to plot your own course.

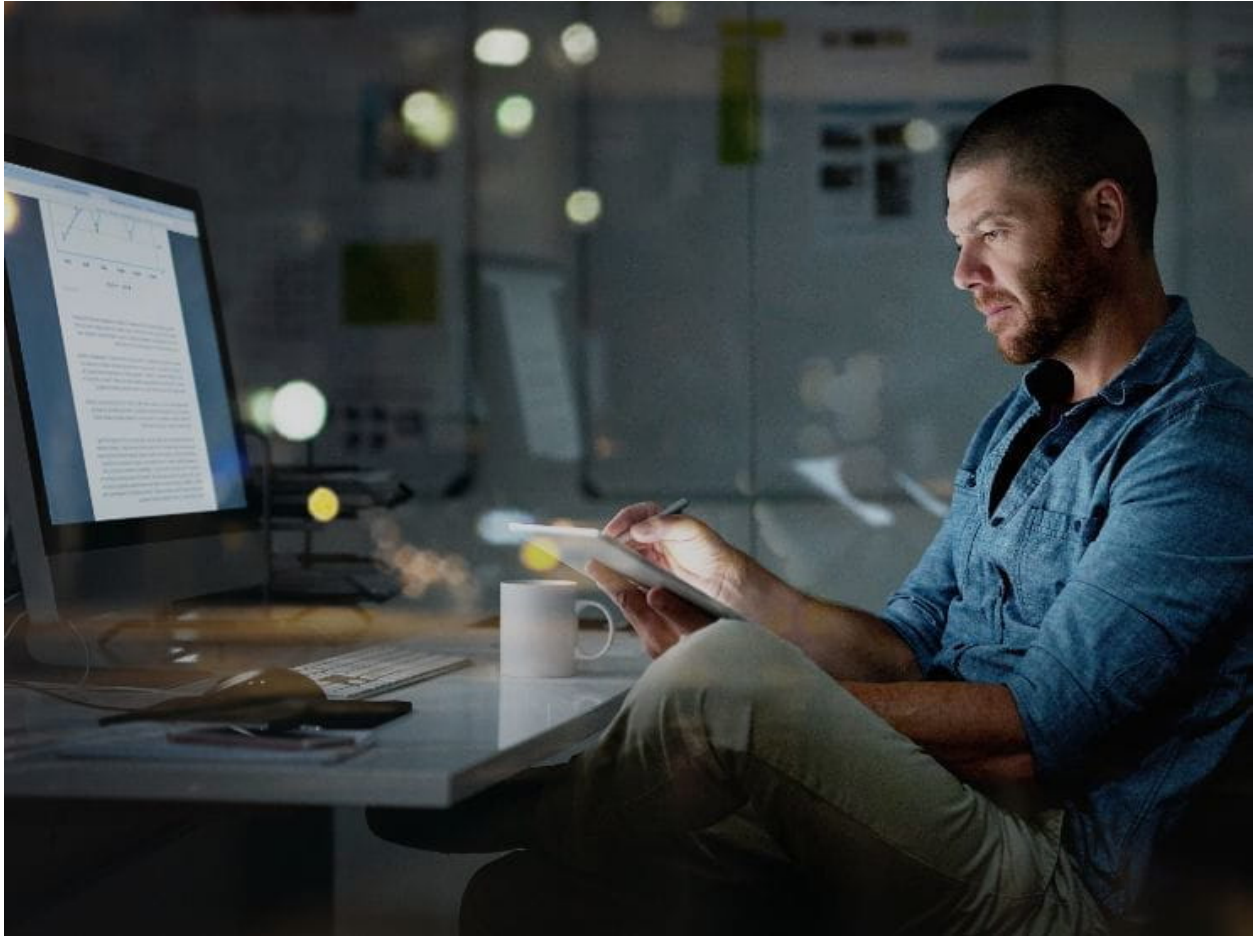
Terms like cloud strategy, cloud transformation, cloud migration and cloud migration services overlap. They're part of an integrated whole, and also mean different things in your cloud journey. In our series of blog posts on cloud migration, we'll break them down into commonly agreed definitions so that you can see how they operate independently and how they fit together.

- **Cloud strategy** is what you want the cloud to do for your business in terms of operational outcomes.

- **Cloud transformation** is the process of using the cloud to achieve those outcomes over time.
- **Cloud migration** is a method for actualizing the change of migrating chosen applications, workloads and storage to the cloud to make those operational outcomes real and active.
- **Cloud migration** services and tools facilitate the process of cloud migration through automation that simplifies, organizes and standardizes fulfillment of steps in the migration progress.
- **Cloud services providers (CSPs)** provide the cloud environments, architectural building blocks, services and tools for planning, migration, management and optimization of applications and workloads in the cloud.

Cloud migration managed services providers act as partners to your business. They bring the experience and expertise in all the above to create, implement, guide, adjust, manage and optimize each aspect of your cloud transformation roadmap. The goal is to help your organization define and achieve improved business operational outcomes with the cloud.

This blog and the connected cloud migration blog post series are an ongoing knowledge bank to support your cloud journey. As an IT leader, you may have some or all this knowledge, but what has been missing is a central repository of that information in a language that stakeholders can understand. We'll start at the beginning with cloud transformation.



## What is cloud transformation?

Although there are aspects where everyone agrees, there's no universal consensus on a single definition of the terms 'cloud transformation' and 'cloud migration.' That's because every cloud transformation and every cloud migration is a unique experience. What we can agree on is that they both have a profound impact on the interaction of people, processes and technology working in concert with applications, data and storage.

With that in mind, cloud transformation is about how the dynamics of on-premises applications, workloads and storage are changed by moving them to the cloud. Cloud transformation is never a single event with a singular outcome, but an ongoing series of events with a potential host of defined outcomes. [In this blog on cloud transformation](#), we start with the premise that successful transformation requires an understanding that it is not a destination, but a journey plotted via a strategy and roadmap.

Cloud transformation represents the continuity, resilience and agility that your business needs to adapt and thrive in the digital era of a post-pandemic business landscape.

You'll build your cloud transformation strategy on a journey of reaching specific goals through applications and workload migration to the cloud that will include:

- Specific cost advantage
- Operational advantages
- Security advantages

Achieving these goals by building a strategy and starting the cloud transformation journey requires significant partnership across the enterprise. We focus the strategy on fulfilling the four stages of ongoing cloud transformation via migration, which include:

- Planning and design
- Delivery and migration
- Management
- Optimization

There are very few organizations at the very beginning of their cloud transformation journey and just taking the first steps to the cloud. There are even fewer that are far down the road with a maturing cloud-native approach. This comes down to a business or enterprise where all of its people, processes, and technology are interacting with applications, workloads and storage in differing cloud environments.

You're likely on the road but still determining directions and defining targeted outcomes for cloud transformation. That's why the cloud transformation blog is an important living document you can refer to for defining your constantly developing cloud strategy and roadmap.

### **How current environment understanding affects cloud transformation**

What you want to accomplish in the cloud starts with understanding your current state to plot the proper course to get to those defined business outcomes through cloud transformation. Reviewing your current environment (people processes, networking, applications, workloads and storage) holds the key to determining what, where and how to move to the cloud. Your business outcomes or objectives are some combination of cost savings, scalability, access, security and business agility in the broadest sense. By pairing these objectives with a full view of your current-state environment, you can determine:

- Which applications, workloads, storage and their application dependencies bring the biggest bang through migration.
- Which of these should you move when, how and where.

The answer to these questions hinges on whether you have the internal IT expertise and availability to design and implement the transformation and migration strategy. You'll determine these answers by how the cloud affects your users.

### **Understanding your user environment**

Cloud transformation will change the way your business operates and how people do their jobs. Usage and access aspects of a cloud transformation can be tied to the complexities of data/cloud security and the regulatory compliance demands that often drive them. They all require that end-users understand:

- The nature and timetable of the changes
- How these changes affect how they complete their work tasks
- What these changes will do to enhance their efficiency and effectiveness in completing daily tasks

The goal is to ensure that your users understand and embrace what's in it for them and how it will affect and improve their interaction with business applications. So, change management is extremely important when developing a cloud transformation strategy.

### **Security and regulatory considerations**

People, processes, applications, workloads and storage that'll be part of a cloud transformation strategy require a strong emphasis on security governance and regulatory compliance. This is so that access to data and applications whether on-premises or in the cloud are part of an integrated whole, which requires determining:

- Regulatory compliance needs
- Identity access management (IAM) needs
- Data security needs for data in transit and at rest

Your successful cloud transformation journey hinges on a detailed analysis of sensitive data, and where it's stored today and where it needs to be stored tomorrow for the greatest business benefit. This is where understanding the nature and possibilities of cloud transformation fit into the development of your cloud transformation roadmap.



### **Developing the cloud transformation roadmap**

The cloud transformation roadmap deals with everything from detailed design to choosing the right cloud provider, security hardening and implementation/migration. Your roadmap will encompass hybrid and multicloud architectures that will require application and workload placement across public cloud services providers (CSP). These CSPs may include Microsoft Azure, Amazon Web Services (AWS), Google Cloud, or Oracle Cloud.

The applications, workloads and storage you move to the cloud will be based on your understanding of what each major cloud provider offers. You can then match that to your varied transformation needs. You'll have different reasons for choosing a CSP for a particular application or workload. But we base the big picture of importance for each decision on how that CSP makes user tasks and access easier and more efficient, cost effective, agile and fast.

### **Enterprise application migration roadmap**

Your cloud transformation is likely focused on migration of on-premises business enterprise applications that include one or some combination of:

- Enterprise performance management (EPM)
- Enterprise resource planning (ERP)
- Customer relationship management (CRM)
- Financial management
- Human capital management
- Supply chain management
- Transportation management

Cloud strategy and cloud transformation define the big picture of why your business leverages the cloud to make applications, workloads and storage adaptive, agile, scalable, resilient and secure for a mobile workforce and global customer base. But it's the cloud migration strategy that defines what, when, how and where.

### **Planning a cloud migration strategy**

When planning a cloud migration strategy, the goal is to help you formulate the answers to the many questions that all revolve around what to move where, why, how and when. Every cloud migration strategy should be about aligning business needs with application, workload and storage migration options that deliver:

- Lower capex
- Increased capacity, elasticity and scalability
- New services and revenue streams
- Improved application access for a remote and global workforce
- Increased security and control
- Streamlined and adaptable business continuity and disaster recovery (BCDR)
- Improved compliance, governance, efficiency, operational management and time to market

The first step in fleshing out a detailed cloud migration strategy is understanding exactly what is a cloud migration strategy?

### **What is a cloud migration strategy?**

Most organizations understand that a [cloud migration strategy](#) is the foundation of their near and long-term plans for operation efficiency and business innovation. The strategy

guides pre- to post-migration planning that determines how the cloud changes current and future business operations and outcomes.

It's important to understand that this cloud migration strategy is a long-term living document that views current and future application and workload migrations through the lens of your business strategy for cloud migration. The business strategy for cloud migration is a more granular view of your overall cloud strategy and the impact that migration will have on improving business operations and outcomes. This helps you to build the business case for migration that enterprise stakeholders and end-user support requires. For stakeholders, that means giving them a clear vision of what you expect to gain. There are many post-migration expectations of gains that a company may have that include:

- Cost management
- Accessibility, resilience and scalability
- New services, business lines and markets
- Improved customer experience
- Security
- Governance and compliance

Improved security, governance and compliance are integral to achieving the other business expectations of a cloud migration strategy and expectations in their own right. This adds a layer of complexity to creating the migration strategy and bringing it to fruition and ensuring data security at rest and in transit through encryption, Identity Access Management (IAM) and other tools and frameworks.

A clear understanding of costs that range from total cost of ownership (TCO) and return on investment (ROI) to capex and opex will always govern your cloud transformation strategy. You must clearly express this to stakeholders by showing how the TCO of public cloud services are less than the TCO of on-premises alternatives. The good news is that there are many ways to optimize this balance. But it's not so easy to determine the costs versus ROI of cloud migrations for hybrid or multicloud environments across several cloud providers.

The process of determining expectations like costs and other defined outcomes you have for your cloud migration strategy requires a deep understanding of CSPs and cloud architecture layers.

### **Assessing cloud providers and architecture layers**

Although there are others, it's best to focus on the four major CSPs of Amazon Web Services, (AWS) Microsoft Azure, Google Cloud Platform (GCP), and Oracle Cloud Infrastructure (OCI). These cloud providers have an encyclopedia of common services,



tools and methodologies with proprietary approaches to each. They also have highly specific strengths that set them apart from one another. Besides supporting detailed pay-as-you-go models, they also provide support for all three cloud architecture layers, including:

- Software-as-a-Service (SaaS)
- Infrastructure-as-a-Service (IaaS)
- Platform-as-a-Service (PaaS)

Understanding how SaaS, IaaS and PaaS approaches work will help determine which approach is right for each application. The broad strokes of your cloud migration strategy involve decisions of SaaS, PaaS or IaaS cloud architectures, hybrid cloud and multicloud use, application types such as ERP and CRM, and the choice of application providers like Oracle, SAP and Microsoft.

You'll determine how much you can, and want to, manage your applications and workloads in the cloud-based on unique aspects and needs of your cloud transformation strategy. It's important to first understand these cloud architecture layers and how they relate to cloud services and enterprise application hosting. The choice among these layers gives you the initial building blocks for determining which cloud services providers to use when, where and how.

### **Hybrid and multicloud choices**

The business benefits/outcomes you're hoping to achieve and each application and its associated workloads and storage through your cloud strategy will guide your use of hybrid cloud and multicloud. This may include scalability, agility, elasticity, mobile workforce and customer accessibility, latency and bandwidth concerns, security, application development, BCDR, and a host of other potential needs.

Hybrid cloud and multicloud adoption brings great agility and flexibility, but it also brings complexity via the needs of connectivity and hybrid/multi-cloud management where:

- Hybrid can be a mix of on-premises data center, public cloud and private cloud
- Multicloud is the use of two or more cloud compute services from two or more CSPs

Since business outcomes dictate where an application will run, that could mean using GCP for machine learning, Azure for Active Directory and databases, and running enterprise apps like ERP on Oracle. Cloud-native workloads built for the cloud, DevOps needs and edge computing may point to other clouds.

These varied clouds require a collective single-pane-of-glass management and control functionality through highly specific cloud services and tools to minimize complexity and costs. These are all interconnected choices within your cloud migration strategy, which becomes more apparent as you go through the following steps in your cloud migration strategy.

### **Steps in a cloud migration strategy**

The success of your public cloud migration strategy will hinge on a variety of factors that as we said are interconnected and will be implemented via a series of steps in your cloud migration strategy:

- Preparing your people for the cultural change of cloud migration
- Application mapping and infrastructure assessment
- Application migration choices
- Migration timelines (when to migrate what)
- Network modernization and performance considerations
- Bandwidth and latency considerations

### **Preparing for business cultural changes**

Preparing everyone affected by cloud migration for the process and the outcome on a departmental and enterprise-wide basis requires a change management process that makes sure:

- People across the enterprise are aware of the upcoming migration
- They know what to expect in terms of how it will improve the way they work
- Education plans are in place, so everyone has a smooth transition
- They have a contact to answer questions or provide their own input

This cultural change leads to the business outcomes that lower costs, increase the bottom line and grow the customer base.

### **Application mapping and infrastructure assessment**

Preparing your infrastructure for the changes of the cloud migration strategy starts with getting a detailed understanding of the organization's application portfolio and its dependencies. This process of application mapping will inform what workloads and applications will move to the cloud.

This will help determine whether you will take a phased or big bang approach to cloud migration so that you can establish timetables and processes. The migration process for each app comes down to one of five approaches:

- **Lift and shift/rehosting** – moving applications to the cloud as-is.
- **Refactor** – changing the app’s code to better support the cloud environment.
- **Replatform** – moving applications to the cloud without major changes but taking advantage of benefits of the cloud environment.
- **Rebuild** – rewriting the application from scratch.
- **Replace** – retiring the application and replacing it with a new cloud-native application.

### **Network assessment and management**

Your [internal network](#) will play a big role in the cloud migration strategy from pre- to post-migration, since it will need to support migration processes, load balancing and other aspects connected to application access, latency, bandwidth and optimization. Determining current state requires a network assessment to map application traffic, connections and devices.

This will include security assessments such as penetration testing and patch assessment to pinpoint any potential problems before the migration. The goal is to get a full view of the current state so that you can determine the needs for any network updates to accommodate a cloud migration end state by identifying:

- Network design flaws and inefficiencies that you must correct to maximize network efficiency, agility, flexibility and resiliency
- Bandwidth congestion, bottlenecks and latency challenges
- Security and compliance vulnerabilities

This becomes a foundation for any network update planning to maximize agility, flexibility and resiliency for the cloud migration strategy. It also helps identify network growth and efficiency options like software-defined networking (SDN) that support hybrid and multicloud distribution strategies along with reliability, security and compliance in the cloud.

Network optimization is a vital link in cloud migration and computing where application access and security are paramount in the post pandemic, mobile workforce age. SDN and software-defined wide area networks (SD-WAN) are critical to making that happen. That’s why SD-WAN adoption has increased, with an 84.7% year-on-year growth rate, according to our [2020 Global Network Insights Report](#). These and other factors play a foundational role in setting up your cloud migration environment.

## **Setting up the cloud migration environment**

Once you've mapped applications, dependencies, infrastructure and network needs, you're ready to begin designing and setting up the cloud architecture by first estimating infrastructure costs based on data storage needs, traffic and CPU memory/resource use. Some apps may require code changes, so you'll need to have a DevOps team to create an infrastructure as code (IAC) environment.

This will streamline the updating of legacy app code or conversion of apps into microservices. Another intertwined aspect of this environment setup includes implementing a Continuous Integration/Continuous Delivery (CI/CD) process for streamlined app updates to improve services, security and flexibility.

Applications, workloads and associated databases are continually changing because of new data input, updates and user process changes that are all part of their normal everyday use. In the data center migration process, businesses must be able to monitor and track these changes.

In addition, businesses must also be able to update these changes in real time without error throughout the migration process, particularly in the testing and cutover phases. It can be a nightmare to manually track these subtle changes without an automation tool that can continually track and replicate the fresh changes as you move through the migration process.

Once you've migrated the applications and workloads, they exist in tandem with the on-prem workloads before the cutover. Proper load testing with the system running in production will reveal any instance-sizing challenges and any bandwidth issues for access that may still exist. Organizations need to test the system in a way that accurately represents the final production environment.

## **Cutover and post migration optimization**

One of the most important aspects of cloud migration is to make sure that you minimize or eliminate operational downtime. This starts with testing your migration before it runs by cloning it to run in your chosen cloud provider environment. The goal is to make sure there are no problems without disrupting business operations.

Then comes the cutover process where you switch from the on-premises application environment to the cloud environment. You may schedule this process during weekends or overnight to avoid downtime. The ability to use automation to monitor application performance post migration is an important part of getting the most out of cloud-based applications and workloads. This ensures continual workload optimization to meet changing demands by maximizing agility, cost savings and process performance gains of the cloud.

The next phase of server and application validation involves checking if migrated server/application/DB are functioning correctly. If so, you can allow the use of the application. The last steps involve any remaining optimization procedures for the application and workload based on end user needs and decommissioning any temporary environments in the cloud, such as sandboxes for testing and any on-premises servers no longer in use.

Your cloud transformation, strategy and the resulting cloud migration roadmap will have many application on-ramps and off-ramps specific to your journey. This will often determine the CSP and its tools and service approach that you choose for migration based on:

- The applications you choose to migrate
- How they interact with other applications, end users, storage and the network
- The way they can shape end user and customer user experiences (UX) via services

The only way to confirm a project's success is through post-migration validation. Validation testing and the ability to go back and take an iterative and ongoing approach to data center transformation can assure the success of the initial project, while actually delivering on the promise of ongoing optimization and management. CSPs take different approaches to common tools and services needed for migration, placement, management, optimization and basic security/governance.

### **Leveraging cloud migration services**

Our blog on leveraging cloud migration services and tools shows how the choosing among the many options will be a key determining factor in reaching specific top- and bottom-line goals through greater operational agility, scalability, security and resiliency. Cloud migration services refer to the way businesses move to the cloud along with the tools and providers that get them there.

This comprises a potentially vast list of services and tools that are delivered by CSPs, cloud migration managed services providers and third-party vendors. When you choose and use the right combination, you can leverage them to create an efficient and overwhelmingly automated cloud migration process.

### **The role of cloud migration services providers**

It would take volumes to provide a detailed list of cloud migration services and tools from CSPs, cloud migration managed services providers and the third-party tools and services from vendors. **But, our blog post on leveraging [cloud migration services](#)** helps build a foundation of understanding about each CSPs (AWS, Azure, GCP, OCI) primary migration and transfer services.

This expands to include some of their more recent service additions that have a big impact on automating different aspects of the process across hybrid and multicloud architectures in services to your goals and defined outcomes for real-world business operations and customer service gains.

### **Leveraging cloud migration tools and services**

Cloud migration and automation tools play a key role in your cloud migration journey. The list of software tools and services from CSPs, cloud migration managed services providers and third-party tools is long. They need to accommodate varied needs from hybrid and multicloud to different cloud architectures. These services become the foundation to quickly, cost effectively and efficiently handle the following:

- Moving data between on-premises and cloud systems
- Maximizing flexibility to place workloads in a cloud environment for which they are best suited
- Cross-platform operating system migrations
- Hardware migrations because of upgrade or failure
- Delivery of scalable, robust and easily managed data cleansing and replication tools
- Automating the migration process and handling the variety and volume of data that needs to be migrated across on-prem and cloud environments
- Delivering a single point of control and unified view of all relevant activities that includes network performance, bandwidth and latency issues
- Avoiding vendor lock-in
- Maximizing cost efficiencies, accessibility and security

Automated services and tools from CSPs, cloud migration managed services providers, and third-party software vendors can remove the business risk associated with error prone, resource intensive and expensive manual migrations. Automation provides live migrations with near zero downtime and the ability to migrate:

- Multiple sources
- Any virtual workload (HyperV, VMware Fusion, Oracle VM VirtualBox)
- Any public cloud (Azure, AWS, Google, Oracle)
- Workloads at a co-location facility or MSP, and any physical to a VMware virtualized data center

It's still more than a fulltime job to keep up with all the available cloud migration tools and services, gaining the expertise in using and determining which are best for every

unique situation, and knowing how to manage it all. Your team needs to know how to integrate them into a long-term cloud strategy and minimize the number of tools and services through a best-of-breed approach. This supports a successful cloud journey and future business state. Since this is a heavy burden for even the largest enterprise, you should ask yourself:

- Do I have the skilled personnel with the expertise in cloud migration and the major cloud providers that can handle all aspects of the migration?
- Do I have enough of these resources to ensure the migration and other important IT projects get done without compromising quality, costs, and efficiency?

It's nearly impossible for even the largest enterprise and IT organizations to answer yes to both questions. Getting those answers requires a deep understanding of your environment from the infrastructure (IT/OT) to their interaction with people and processes.

### **The role of cloud migration services providers**

The right cloud migration managed services partner can be like the GPS on your cloud transformation journey by helping you plot the right course at every turn. 72.1% of IT leaders engage with systems integrators as partners to bring the needed skills and expertise for cloud migration according to our [2021 Hybrid Cloud Report](#). Their role as your partner is to help you achieve the business outcomes that will make you competitive in a changing digital future by bringing:

- Significant experience transforming workloads to run in public, hybrid and multicloud environments and architectures
- Constantly updated knowledge of the intricacies of all major cloud providers and their strengths that can also deliver [managed application services](#) support
- A track record of successful enterprise application migrations across major solution providers and your specific industry
- Change management experience to support end-user preparation and transition to the cloud
- IT and OT environment assessment capabilities along with application mapping and migration choice assessment experience
- Deep cloud security and governance integration experience

The best of these cloud migration consulting services become partners that support customized cloud and migration strategy development that can adapt to your enterprise's ongoing migration and transformation journey needs. An ideal cloud migration managed services partner should bring extensive experience in application

optimization, management and security. These cloud migration experts should be capable of taking on-premises enterprise applications to cloud environments via [Application Services](#) that span the most commonly used enterprise applications.

Since every successful cloud migration strategy has security built into every aspect of the cloud journey, having integrated [managed security](#) laser-focused on security and governance is paramount. This ensures that they can provide an integrated portfolio of [Managed Public Cloud Services](#) that include:

- Ongoing cybersecurity advisory and security consulting
- Cloud assessment and transformation
- Merger and acquisition assessments
- Regulatory compliance consulting

We've built our Managed Services on the partnerships, experience and expertise that come from understanding your specific business. That helps us understand what, when and how to use the services, tools, processes and platforms to achieve your specific goals. That means taking the time to understand your organizational culture, scope, people and goals. To learn more about cloud transformation and migration visit ([Link based on either cloud migration pillar, other migration posts or pillar page](#)).

We work to help define and share your vision for business outcomes by seeing and understanding what makes your IT organization, your business and your people unique. That has built our foundation of success with businesses like yours in defining where you want to be in the digital age, what you want to do today and tomorrow, and supporting you on every mile of your cloud journey.

To learn more about our cloud migration services, follow [this link](#). Then, let's talk about your vision for cloud migration and how our cloud transformation/migration services can make that vision a reality.