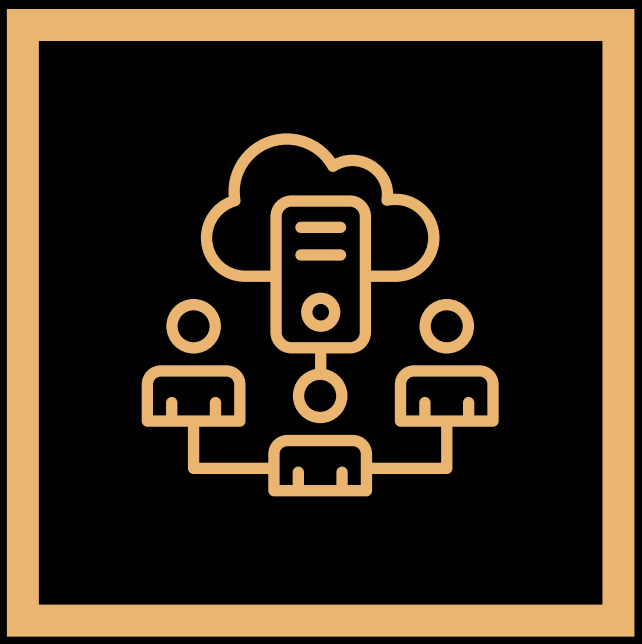


A Guide to Cloud Migration

A #ThinkBeyond Best Practice Series

PHOTON®

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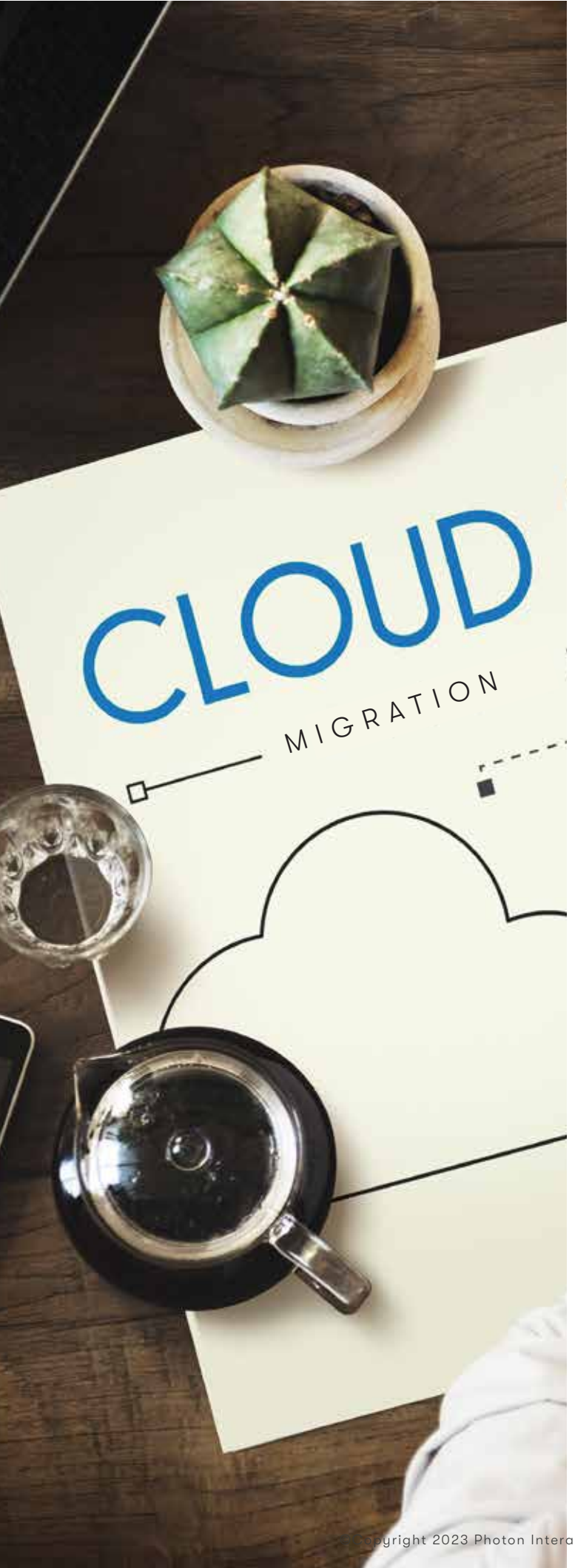


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What is a **cloud-first approach?**

The cloud has assumed a dominant role in today's digital business landscape. Enterprises are increasingly embracing a cloud-first strategy to enable agile application development, foster continual innovation, and gain flexibility in their operations to better meet business requirements as well as customer demands.

A cloud-first approach uses the public or private cloud—rather than relying on traditional IT infrastructure—to improve collaboration among teams within the organization, boost productivity, scale and centralize applications, and deliver robust and personalized customer experiences.

The cloud's benefits are moving beyond the primary function of hosting data and saving costs. In the present day, digitally-driven enterprises are continually disrupting and leveraging cloud technology in unprecedented ways—be it to power advanced big data analytics or to enable, at scale, AI-powered smart intelligence.



$1.3 trillion

in IT spending will be affected by the shift to cloud by 2022[1]

94%

of enterprises use some form of the cloud[2]

Why cloud migration is key to accelerating **digital transformation**

There is a strong correlation between the cloud and digital transformation. In order to progress in the digital transformation journey, enterprises must leverage disruptive technologies such as artificial intelligence (AI), Internet-of-Things (IoT), big data analytics, augmented or virtual reality (AR/VR), and machine learning. However, these technologies need heavy computing power, speedy data, ample storage, and a robust infrastructure. Cloud technology delivers on these requirements, thereby facilitating the digital transformation of the enterprise. The Cloud Industry Forum has reported that **80% of enterprises consider the cloud important to their digital transformation strategy.**[3]

As also noted by Photon's CTO and Co-Founder, Mukund Balasubramanian, **"Robust cloud migration strategies allow for the disruption of business models, streamlining of operations, and innovation of services at a rapid pace. The cloud is key to transforming customer experiences and excelling as a fast-paced, digitally-enabled enterprise."**

Top Five **Digital Technologies** Already Implemented



Source: '2018 State of Digital Business Transformation' by IDG

IDG conducted a survey to understand the state of digital transformation in companies belonging to various industries—including high tech, financial services, manufacturing, retail, and healthcare. All 628 respondents of the survey were part of an organization that is planning to adopt or has already adopted a digital-first business approach. The survey revealed that **private cloud (53%) and public cloud (45%) are among the top five digital technologies that are already being leveraged by companies to accelerate digital transformation.**[4]

Photon has rich experience in devising robust cloud-first strategies for global enterprises, empowering them to accelerate their digital transformation and realize tangible business outcomes. The Photon Cloud Architecture Program has afforded Fortune 500 enterprises the agility to improve their operational efficiencies, increase the pace of innovation, and become hyper-responsive to changing market needs. The following section takes a deeper look into the core features and benefits of the Photon Cloud Architecture.

Cloud service type	2020	2021	2022
Cloud application services (SaaS)	110.5	126.7	143.7
Cloud application infrastructure services (PaaS)	23.0	27.5	31.8
Cloud system infrastructure services (IaaS)	49.1	61.9	76.6
Cloud business process services (BPaaS)	53.1	57.0	61.1
Cloud management and security services	14.1	16.0	17.9
Total market	**249.8**	**289.1**	**331.2**

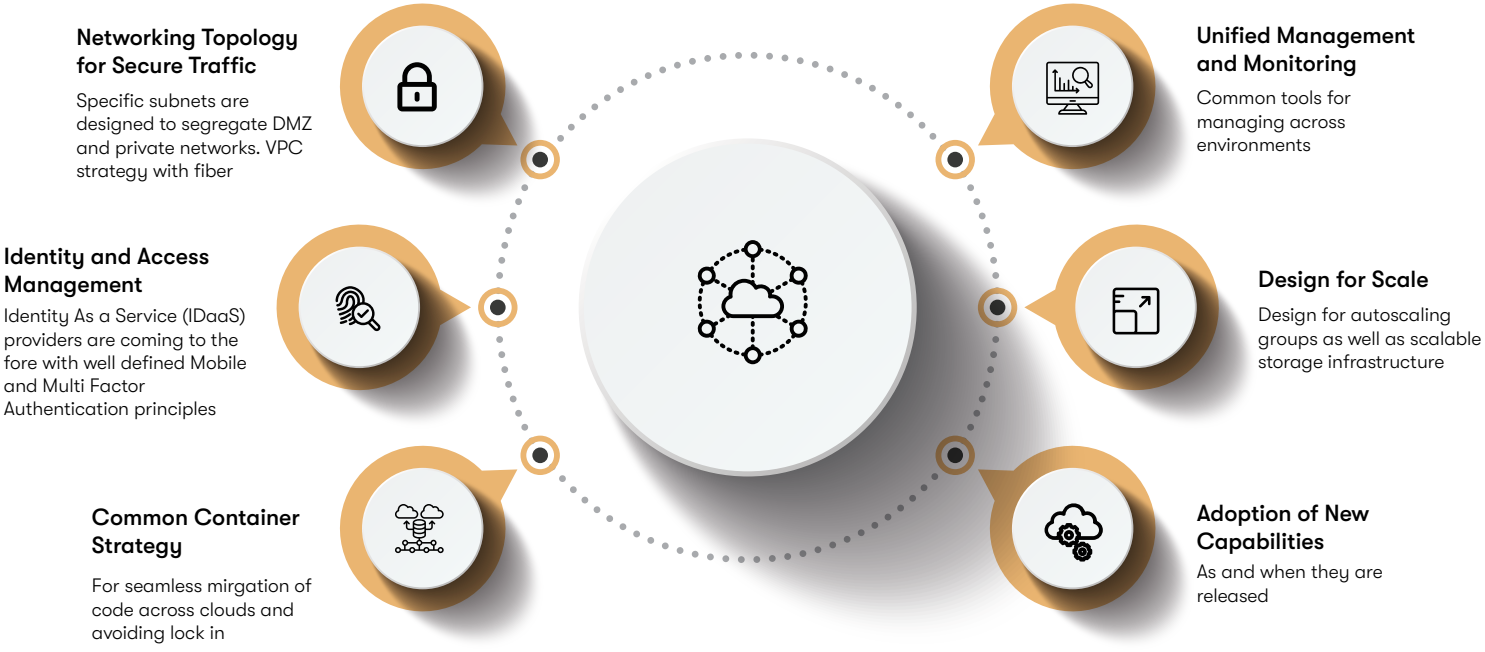
Worldwide cloud service revenue forecast ($ billion) by Gartner[5]



Photon Cloud Architecture Program: **Unlocking the cloud's true potential**

The Photon Cloud Architecture Program guides enterprises to create new infrastructure models and develop tools that originate and operate in the cloud. Highly agile, responsive, and efficient, Photon's architecture ensures faster time to market, reduced complexity in IT frameworks, and lower upfront investments and operational costs. Below are the key features of the architecture.

Photon Cloud Architecture



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Networking topology for secure traffic

A virtual private cloud (VPC) allows companies to secure their networking environment, which includes subnets, IP addresses, and network gateways. With VPC, the network traffic of certain applications can be managed to optimize their performance and prevent bottlenecks.

A perimeter network, or DMZ (from the term "demilitarized zone") segregates the network into multiple blocks to improve security. With the help of intrusion prevention systems and a firewall, this DMZ creates distinct network segments through which only defined traffic can pass. The network topology can be planned in advance to decide which traffic is to pass between the defined network segments. A DMZ on a virtual environment reduces the cost of network configuration and maintenance. This security layer is a best practice with regard to using the cloud to drive digital strategies.

Identity and access management

Identity and access management (IAM) involves defining and managing access privileges of network users. It helps enterprises make sure that the right users are granted access to the right assets. IAM systems help manage the roles of users, track their activities, and enforce policies. Identity-as-a-Service (IDaaS) is a cloud-based service that enables identity governance and administration (IGA), access, and intelligence. IGA offers visibility and control in terms of information access while supporting enterprise IT security and regulatory compliance.

Common container strategy

Containers solve the problem of how to get software to run reliably when moved from one environment to another. They also help companies safely complete their cloud migration. Containers have other benefits, such as cost savings and an environment for DevOps, but cloud provider flexibility is key.

If a company writes applications for a specific cloud service provider, it can get locked into the provider's proprietary architecture. But containers negate this issue by creating an isolated and self-contained environment for applications.

Containers, therefore, enable applications to run efficiently even if moved from one environment to another. This flexibility creates significant cost savings as companies no longer need to rewrite applications if they want to shift to another platform. Containers also help in breaking down large software projects into independent modules, making application building more scalable and platform independent.

Unified management and monitoring

Enterprises are increasingly finding value in hybrid cloud or multiple cloud platforms from various providers. However, the hybrid model poses several management challenges in terms of performance, security, compliance, and governance. Cloud management platforms help in centralizing these functions for private and public clouds. These platforms help manage and monitor all cloud-based services,

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as well as storage, to address workload and performance requirements. They also use real-time analytics and reporting to automate resource consumption tracking. Further, they manage network and server resources with capabilities like migration, tagging, discovery, and provisioning.

Design for scale

Moving to the cloud allows for autoscaling, which is a feature that automatically monitors and manages the computing resources based on the volume of user requests. Autoscaling tracks applications and adjusts capacity to minimize costs while maintaining steady performance. Capacity is dynamically increased or decreased, ensuring better cost management. The infinite scalability afforded by the cloud helps companies expand any application or infrastructure to handle increased workload. A scalable system helps keep applications running even during peak times, thereby preventing loss of capital and reputation.

Adoption of new capabilities

Cloud environments offer the flexibility required to add new features or capabilities as per business demands. These may include security updates, big data analytics, and other on-demand services. The subscription model of cloud services ensures that a company is able to upgrade its cloud infrastructure as and when required while saving time, capital, and resources.



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Cloud selection criteria

When an organization contemplates cloud migration, there has to be a perfect understanding of the current state of the cloud journey. A readiness assessment followed by the analysis of operational costs and the risks involved are an important part of the migration plan. Another crucial decision is choosing the right cloud partner—one that can understand specific business requirements, overcome challenges, and keep the project on track and on budget.

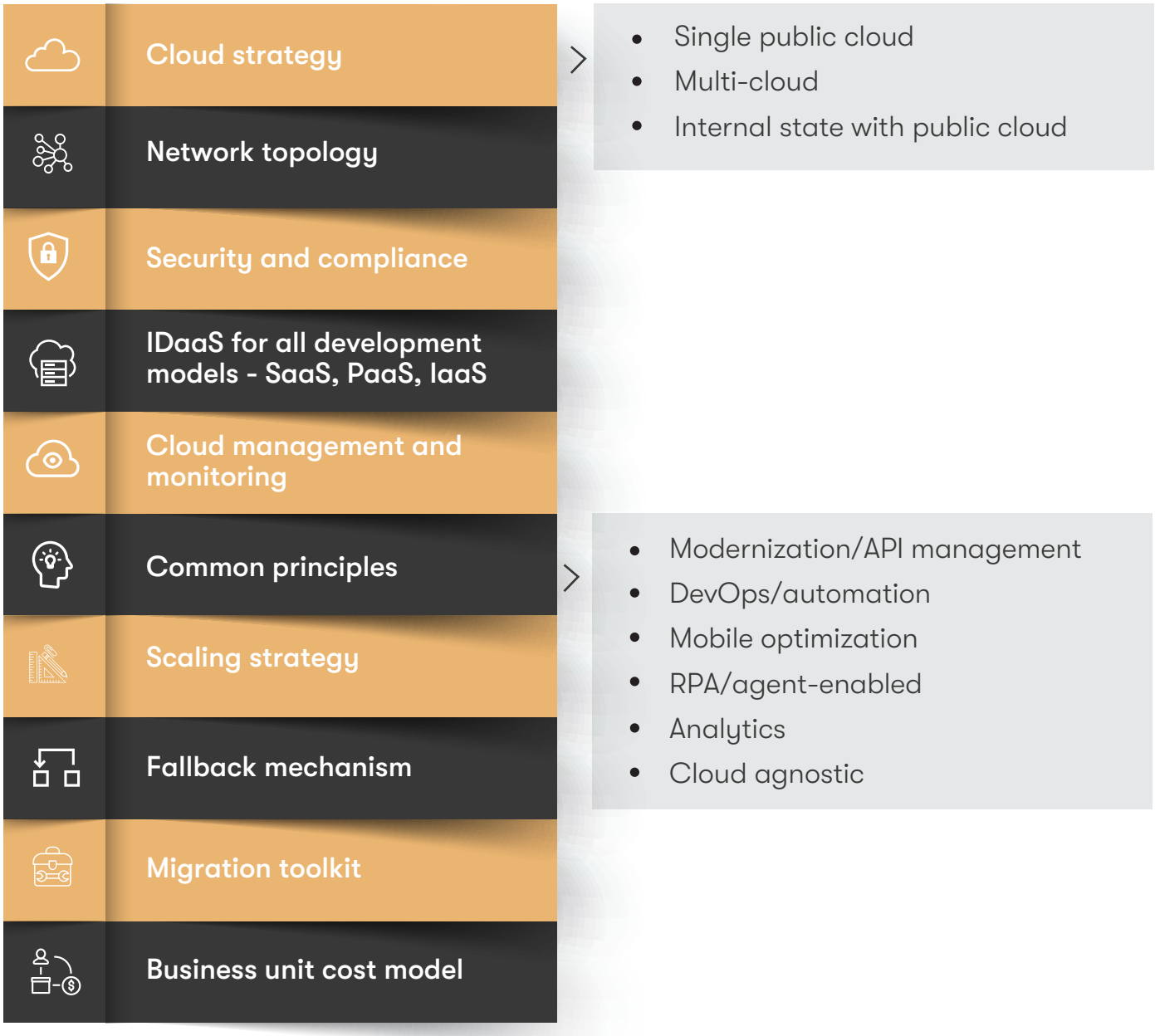
Below is a list of questions that will help you determine the right cloud service provider for your business needs.

- **What type of application is being migrated?**
- **If custom, what is the technology stack?**
- **If COTS (commercial off-the-shelf), what is the vendor's cloud readiness status?**
- **If cloud-optimized, which type of cloud will the vendor's roadmap support?**
- **Is the application supported by COE, preferred cloud platform?**
- **Will this application integrate with other systems or applications?**
- **Will these integrations be real-time or batch or both?**
- **If batch, which type of cloud will support other applications?**
- **If batch, how much data will be transferred over the outside network?**
- **Which zone do the users of the application belong to?**

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Required components for a **successful cloud migration**

Organizations place cloud migration high on their agenda if they are committed to digital transformation and innovation. However, the migration of workloads and applications to the cloud can be a challenging process. Below are key components that help make this process more smart, seamless, and effective.



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Estimating the cost of cloud migration: **Cost analysis plan**

According to a survey, cost-cutting tops the list of reasons why organizations choose to shift to the cloud.[6] The scope of an organization's current IT infrastructure and how much of it is to be moved to the cloud largely determines the cost of the migration process. Below are some key points to consider.



Cost-effectiveness

Azure and Google are competing closely with Amazon. Google's recent wins reflect more aggressive pricing and volume discount strategies.



Core applications

While key COTS vendors will support multiple cloud providers, most will select a preferred platform to focus on the development of PaaS-related options.



Specialization

Cloud providers are focused on innovation and differentiation in specific areas (compute, infrastructure, PaaS, AI and data analytics, etc.) which will align with deployment scenarios where a specific provider may be selected to fit the application needs or leverage 'best of' service capabilities.



Market evolution

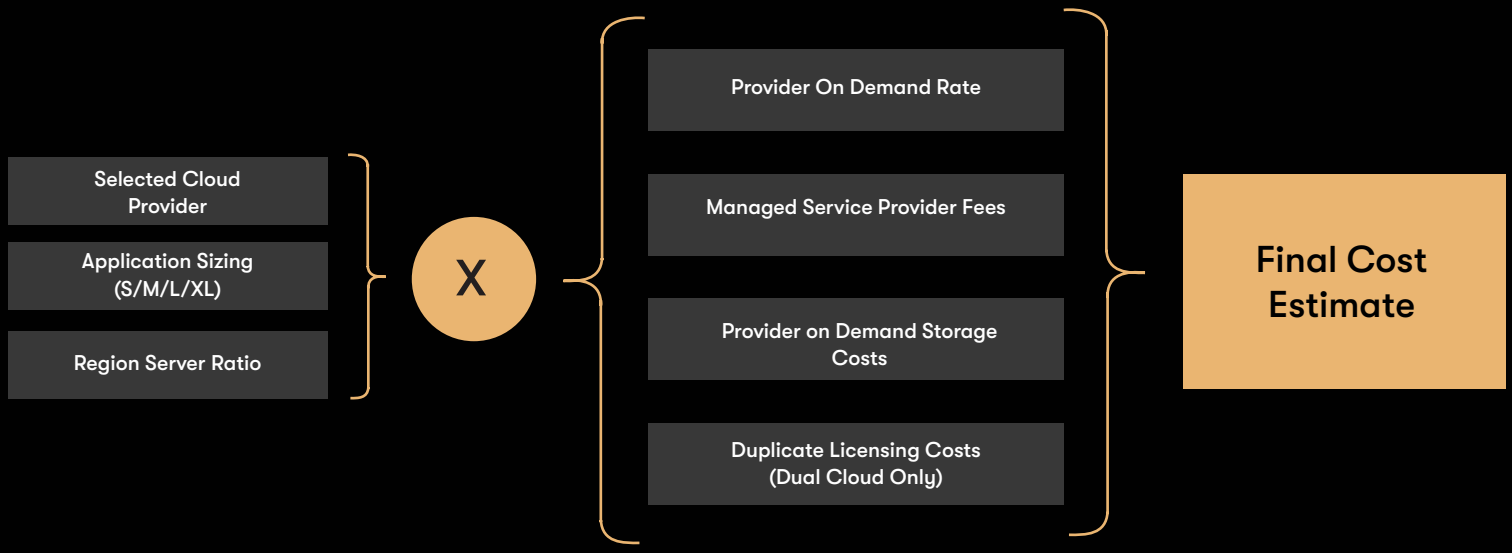
While AWS and Azure are clear market leaders today, the rapid expansion of IaaS, PaaS, and cloud management service offerings represents the relative immaturity of the market and the opportunity for the entry of new and disruptive providers.



Avoid provider and service lock-in

It is imperative that enterprises plan for agility, including the ability to leverage new providers for innovative services, to shift workloads for cost savings, and to adopt technologies that drive efficiencies in cloud operations and management.

Cost analysis methodology





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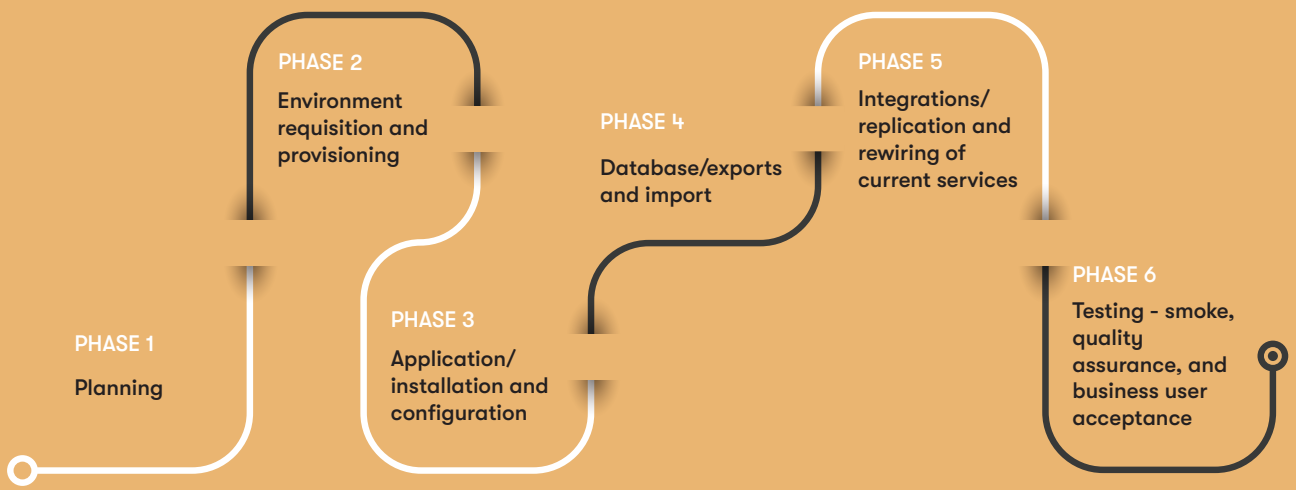
Cloud migration **plan and toolkit**

Moving to the cloud is one of the best business decisions that enterprises can make as they prepare to take their applications and services to the next level. However, to make the most of the cloud and the myriad benefits the technology can afford, companies must go about the migration process with proper planning, execution, and testing.

Cloud migration plan

- Leverage details captured from inventory analysis to produce a phase-wise migration plan and cost estimates by data center
- Additional automated discovery and dependency mapping to validate servers, applications supported, deployment configurations, and service dependencies
- Migration size assigned to each application by assessing them based on criticality, complexity, type, nature, and volume of integration support required, and supporting hardware

The program plan is broken into the following phases:



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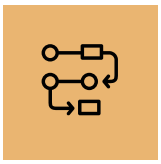
Migration toolkit



Foundation migration data

To confirm migration assumptions, automated discovery and dependency mapping are required to validate servers, applications supported, deployment configurations, and service dependencies. Below are some benefits:

- Continuous IT service discovery and mapping via SaaS
- Agentless, passive network monitoring and data collection
- Robust multi-layer service discovery for Application Layer, Network Layer, Virtual Layer (VMWare), and Storage Layer
- Identify migration targets based on traffic flow for an application or service including application dependencies
- Confirm integration points including downstream services/applications prior to migration



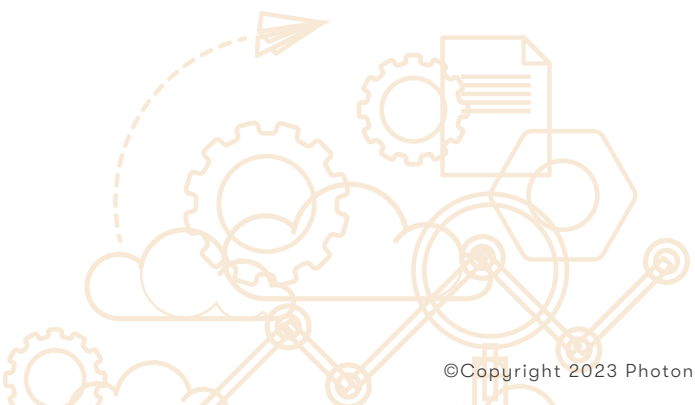
Dependency mapping

Dependency mapping helps to map all applications, network, virtual, and storage relationships and provides a comprehensive view of all server traffic and infrastructure which is supporting the service or application. It has an auto-update feature that first identifies and then adds or deletes changes since the last approval. It streamlines the process to track changes while approving or rejecting them appropriately. The information on these maps can be exported as CSV, XML, PNG, and Visio.



Cloud migration dashboard

A migration dashboard defines the order and keeps track of migrating applications. It identifies migration targets based on traffic flow for an application or service, including communications to other applications and services. It ensures that applications and services do not break by not migrating critical shared components such as middleware.



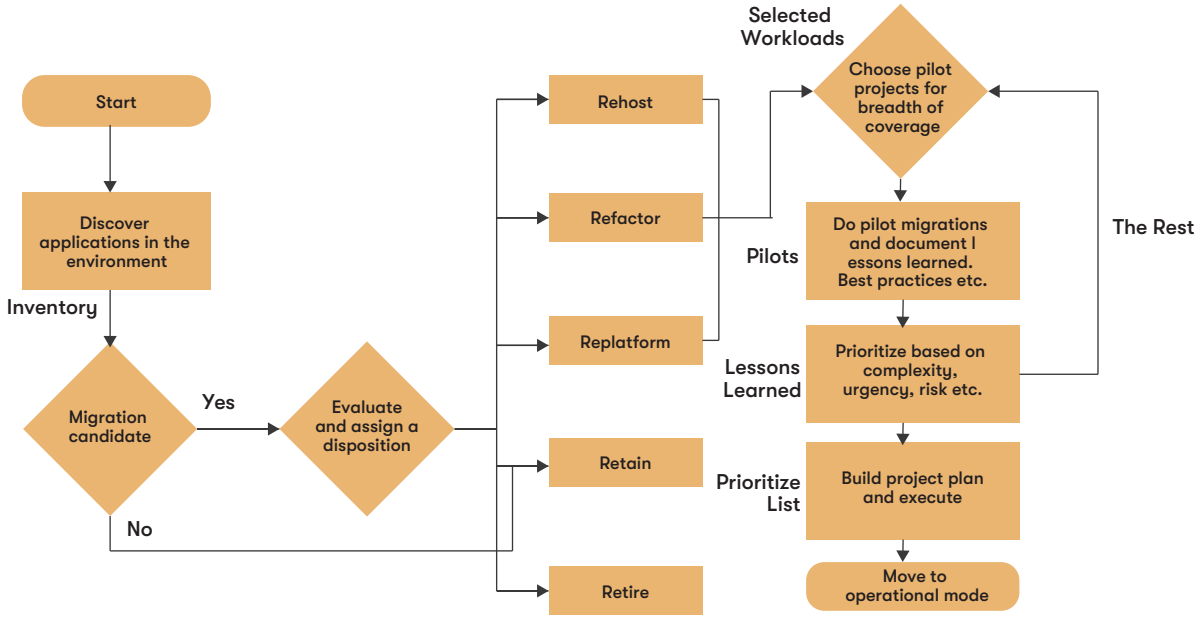
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The ideal **cloud migration framework**

Photon's approach to cloud migration

Data gathering	Analysis and classification	Assessment
• Interviews and data gathering • Manual data capture for applications and supporting technologies	• Automated scanning and dependency mapping • Analyze and classify by following the Gartner/Cloud Migration Assessment Model	• Perform POC for cloud migration • Define vision statement and gap analysis • Define future state and design cloud-ready blueprint

Photon cloud migration framework



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How to reduce the cost of service delivery

Rehost	The application will be rehosted in the cloud largely as-is, supporting Lift-and-Shift to accelerate the realization of the cost benefits the cloud has to offer.
Repurchase SAAS	The application will be replaced with a SaaS offering, moving operational and infrastructure costs with it.
Refactor	The application requires core components to be modified such as database integration and/or application code to support migration to the cloud.
Retire	The application has reached its end-of-life and is either not required any longer or all functionality is already present in another application.
Retain	The application will not be migrated to the cloud and will remain in the current data center and/or server as-is. This is generally due to technologies that are not supported in the cloud or operational requirements that force the application to remain on-prem.
Replatform	The application will be moved to another platform that provides similar or more functionality, is better optimized for the cloud, or consolidates functionality across the organization.

"Businesses today demand more from applications, at a scale that only the cloud can deliver. We help our Fortune 100 clients combine our cloud migration best practices with next-gen technology implementation strategies to accelerate their transformation into agile, fast-paced digital enterprises."



Mukund Balasubramanian,
CTO, Co-Founder at Photon

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Why Photon is a **trusted cloud migration partner for the Fortune 500**

Photon takes pride in being the preferred partner of Fortune 500 companies for driving digital transformation strategies and technological innovation. Below are some instances wherein Photon helped enterprises drive effective cloud-first strategies.

Client:

America's largest banking and financial services company

Requirement:

The company was looking to move to a new digital foundation to take on FinTech startups that were disrupting the consumer banking segment.

Photon's involvement:

Photon helped the company embark on a journey to create a private cloud platform based on the Cloud Foundry platform with six new data centers created to handle the load. The company helped modernize the mainframe by migrating off the traditional mainframe into a newer, all-microservices architecture. Photon continues to be the largest vendor helping with this migration throughout the entire portfolio—starting from Personal and Business banking to payments.



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Client:

An American chain of luxury department stores

Requirement:

The company wanted to migrate all applications and production workloads from their current data center to the public cloud and a co-located facility that is connected to the public cloud in an 18-to-24-month period.

Photon's involvement:

Photon was involved in an in-depth strategy assessment, which resulted in classifying the applications into four decision categories—migration applications as-is, re-architect and move to the cloud, replace with a SaaS provider in the cloud, or Lift-and-Shift to the co-location facility. On a technical front, Photon provided a blueprint, workload identification, run book, migration toolkit, and a POC for application migration to the cloud infrastructure.

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Client:

A major American retail store chain

Requirement:

The company wanted to move all its digital platforms, front to back, to the cloud and further scale the digital business.

Photon's involvement:

The client chose the Amazon platform as the right solution for their business, and Photon helped with the migration of over 40 applications that constitute the digital portfolio into the cloud. Photon helped move the digital channels (mobile and web) as well as Product Information Management, Merchandising Platform, and Search Infrastructure to the cloud. In addition, Photon helped create an aligned approach to enable IT transformation.



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Conclusion

Customer expectations are rising in tandem with advances in digital innovation. Enterprises that acknowledge this trend and, more importantly, act and keep pace with these developments will stay ahead of the competition. Doing so is the key to retaining as well as growing the biggest asset an enterprise can ever have—the customers.

A cloud-first approach empowers enterprises to be operationally nimble, save significant capital expenditure, and innovate faster to better serve their customers. The cloud allows for a powerful, collaborative platform for agile application development and testing such that developers are able to fail and fix quickly to innovate quicker and optimize performance.

Aside from cost savings, operational efficiencies, and infinite scalability, the benefits of the cloud include improved security and compliance, superior customer service, faster time to market, robust data and analytics capabilities—and the list goes on. It is more important now than ever to carry out a cloud-first strategy for enterprises wanting to accelerate digital transformation, grow market share, stay relevant and compete with the growing number of disruptive digitally-native companies.

Connect with Photon today to accelerate your cloud migration journey and gain a sustainable competitive edge.

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Connect with Photon now and accelerate your digital transformation journey.

Photon's mission is to help our clients embrace the power of digital technology. We are the digital transformation partner of choice for leading Fortune 500 companies. We offer an integrated approach combining Strategy Consulting, Creative Design, and Technology at scale. Please visit www.photon.com to learn more about us.

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