

# Cloud Migrations

## The Ultimate Guide for Migrating to the Cloud Now

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# Table of Contents

Introduction.....	3
Why Cloud Migration?.....	4
• Application Modernization	
• Cost Savings	
• Integrations	
• Technical Operations	
Risks of Cloud Migration.....	9
• Moving Too Fast or Slow	
• Choosing the Wrong Partner	
• Not Focusing on Application Characteristics	
• Not Understanding the Application Cost Drivers Associated with a Cloud	
• Not Planning for the Future	
How to Approach Migration.....	15
• Lift-and-Shift	
• Lift-and-Extend	
• Hybrid Extension	
• Full Rebuild	
Why Partner with Faction.....	18

# Introduction

This guide provides background for Infrastructure and Operations teams that need or may need to migrate existing workloads to the cloud. If you are responsible for figuring out whether to move, or how to move, some or all of your existing applications to the cloud, this guide is for you.

This guide addresses several topics:

- **Why Cloud Migration?** Learn what drivers push organizations to move to the cloud.
- **Risks of Cloud Migration** - Learn what analysts and experts have identified as some of the significant risks of cloud migration.
- **How to Approach Cloud Migration**- Learn the four primary methods of migrating to the cloud, and why you might select one over another.
- **Getting Started with Cloud Migration** - Learn about the common types of service engagements that help organizations with their migration requirements.

# Why Cloud Migration?

## Top Cloud Strategy Objectives

27%	Migrate existing workloads to private cloud
24%	Build net-new applications in cloud environments
23%	Migrate existing workloads into a hosted private cloud
22%	Using multiple deployment types (e.g. public, private, hosted private)

*(Source: Forrester Vendor Landscape, Cloud Migration – Respondents could make multiple selections)*

Cloud migration figures prominently into cloud strategy. Two of the top three objectives reported by Forrester directly relate to migration; and the fourth is related to blending net-new application development with migration of existing workloads

While the “cloud strategy objectives” tend to have a technology-centric view, it is advisable to strongly consider the business objectives that drive these technology desires.

**Common business motivations that drive cloud migration include:**

1. Application modernization
2. Cost-savings, integrations
3. Technical operations

## 1. Application Modernization

Application modernization is not a new trend. Replatforming applications to x86 architectures from older technologies started long before cloud began, but the new trend is replatforming directly onto cloud technologies.

**Some questions that an organization must address when targeting cloud platforms include:**

- Which applications are most compatible with each cloud platform? Like public cloud, private cloud, or SaaS?
- Which applications, initiatives, and business units have the most need for aspects of cost savings, agility, and continuous uptime?
- What is our long term data retention strategy?
  - Take into consideration advances in the technology of big data, which will continue to unlock additional value from data sets for organizations.

Because the adoption of cloud technologies goes hand in hand with the idea of “modern applications” which leverage both agile infrastructure and extensive platform tools, enterprises are eager to move to the cloud so that their application modernization efforts can directly target the new cloud technologies, giving up on modernization to x86 as a stepping stone.

Some x86 applications are also now targets of modernization, by virtue of a desire to shift them to a more agile microservices architecture and gain the advantages of much more rapid development to create a competitive advantage.

## 2. Cost Savings

Cost savings is a prominent reason many organizations undertake cloud migration efforts. Top reasons for migrating to the cloud and realizing cost savings include:

- **Closing Datacenters:** to save on operations and maintenance
- **Steady State Operations:** targeting a lower level of infrastructure required for “steady state” operations. This means:
  - Test, development, and staging environments need less infrastructure as they can be created/destroyed “on demand.”
  - Production workloads can scale to accommodate seasonal or other burst workloads without a significant CAPEX investment.
- **Staff Reductions:** as needed on a per-workload basis, as the API-driven paradigm of the cloud lends itself to eliminating repeated work.
  - The shift to self- and automated-service means less touches per activity. Instead of multiple teams each needing to act on a request to create or modify a compute environment, the encapsulation and self-service of cloud environments can allow a single person, possibly even the end developer, to handle an end-to-end environment.
- **Platform Diversity:** to leverage the right platform for a workload.
  - For example, critical but infrequently utilized methods can be shifted to serverless computing, and storage requirements can be fitted to a wide variety of options between extremely “cheap and deep” and extreme performance, each one scaling independently without a centralized team managing a wide variety of storage tiers, and paying only for what is needed.

### 3. Integrations

In an increasingly connected world, shifting to the cloud unlocks value by making it easier to connect applications to partners. Vertically integrating applications to tie together multiple applications and those of vendors, partners, customers has broad appeal. Marketing teams are already heavily reliant on cloud-based systems for managing customer relationships, social media, customer experience, and more. More enterprises than ever are leveraging SaaS platforms for e-commerce, and email, for example.

Legacy applications often have related data and functions and truly unlocking the value requires integrating between those apps and the SaaS platforms. Data gravity, which we discuss at greater length in the [Hybrid Cloud eBook](#), means that data from different (but related) applications wants to be as physically close to each other to avoid negative effects on applications from latency. That means migrations take place for the sake of integrations between legacy apps and SaaS platforms. Sometimes that migration can be a lift-and-shift; other times it means application transformation.

### 4. Technical Operations

Cloud platforms offer infrastructure and operations teams a host of powerful capabilities, including:

- Increased and inexpensive bandwidth options versus on-premises
- Easier geographic reach across many clouds
- Simplified and less expensive backup and recovery options
- Most importantly, the ability to automate many areas of infrastructure operations.
  - Delivering higher service levels and better experiences to internal customers, all while greatly decreasing key infrastructure KPIs, such as time-to-provision, time-to-recovery.

Infrastructure and operations teams handling legacy environments are less focused because they need to strengthen their efforts across almost all realms - physical datacenter operations and all that entails:

- Power and cooling
- Physical security
- Network, compute, and storage
- Security

These teams are often dealing with significant sprawl in terms of their environments, sometimes handling equipment from dozens of vendors, each with their own management tools, support processes and procedures, hardware refresh lifecycles and support contracts. One reason VMware was so successful with the virtualization revolution was its ability to normalize many operations across a variety of hardware platforms, limiting things that needed to be done “bespoke”.

Cloud at its best offers the same gains for network and storage, and in many ways, things like security, logging and auditing, backup and recovery.





# Risks of Cloud Migration

Some people examining cloud migration for the first time believe that the technology risk of cloud migration is the largest risk. The truth is, the technology that supports most migrations has come a long way, and many cloud migrations can now be accomplished easier, faster, and with less risk than ever. The “lift-and-shift” version of cloud migration has an extremely mature toolchain, and offers some of the largest “bang for the buck” in terms of what can be accomplished with a given investment.

Some common risks include:

- Moving too fast or slow
- Choosing the wrong partner
- Not focusing on application characteristics
- Not understanding the application cost drivers associated
- Not planning for the future

## 1. Moving Too Fast or Slow

Moving “too fast” in cloud migration terms typically means putting too much weight on the “lift and shift” aspect of a cloud migration. The downside of this is simply creating a “new” legacy environment where your migration hasn’t delivered any lasting business value or advantage. If your only motivation is a fast transition from one datacenter or provider to another, you can accomplish that without further evaluation - but there are a number of avenues to pursue when you give yourself a bit more time.

For example, you should ask yourself:

- What is your strategy for pursuing hybrid or multi-cloud applications, and how does your lift-and-shift effort support that?
- What is your Backup/DR strategy, and how does your migration effort help or hinder that?

- What is the state of maturity for your DevOps efforts?
- Can you realize cost savings by leveraging horizontal or vertical scaling on-demand of existing applications?
- Does your migration strategy help you with development?
  - Does it help your developer satisfaction or productivity?
  - Does it give developers more optionality with tools or deployments?
- Does your migration strategy help or hurt you with respect to vendor lock-in considerations?

As you can tell, there are a large number of things to consider. You can accomplish all things in time, but you don't have infinite time, so evaluating the costs and benefits of various activities around migration is a critical part of selecting your tactics and vendor.

## 2. Choosing The Wrong Partner

Cloud migration partners tend to fall into one of four categories:

1. Consulting firms
2. Cloud specialists
3. Global system integrators (GSIs)
4. Hosting/Telecom companies

There are no universal truths related to what category a vendor fits into for a particular strength, but there are generalities that can be examined.

For example, **consulting firms** often have a focus on transformation. They tend to emphasize a view of business processes and application portfolios and modernization serving digital transformation activities.

Consulting firms may lack the level of technical ability for solving deeper technical challenges related to the traditional storage, network, and compute aspects of a migration.

**Cloud specialists** are typically both strong at the technology aspect and application knowledge, but they tend to be focused purely on migration to public clouds. Given that 3 of the top 4 strategic objectives for a typical cloud buyer include a private cloud aspect — whether private, hosted private, or private cloud as part of a hybrid or multi-cloud approach — the myopic focus of cloud specialists may be a drawback. For those with a committed “public cloud only” strategy, however, they may be the best option.

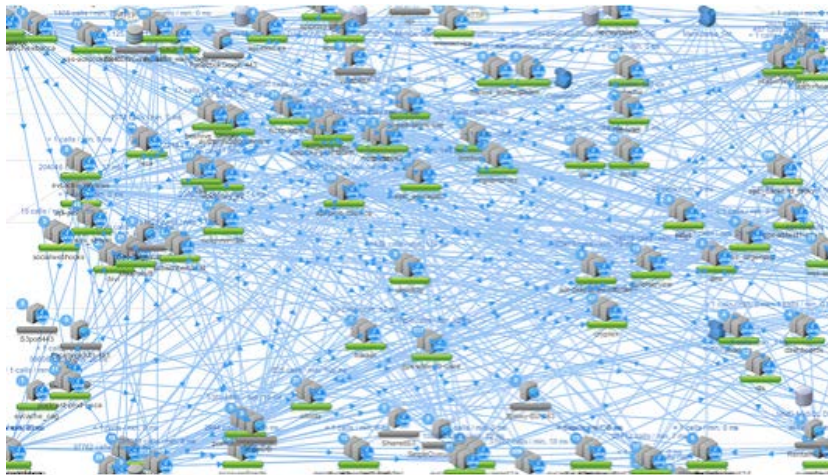
The **Global system integrators (GSIs)** tend to have the most extensive services — they are already involved in legacy modernization, including mainframes, and have software development practices, and often cloud practices as well. Since having the most extensive services is extremely valuable and profitable work for GSI’s, they pursue this aggressively and continue to expand their capabilities.

The **hosting and telecommunications companies** tend to be lift-and-shift focused, but have some growing competencies around applications. Most of them are targeting migrations into their own platforms, or for customers that will retain their services to manage their systems after migration.

### **3. Not Focusing on Application Characteristics**

Application behaviors and dependencies are a critical aspect of a migration, unless you are doing a complete like-for-like full migration. Partial migration, or a migration that plans to extend into hybrid- or multi-cloud strategies, necessitates taking a view of which applications interact with others.

Some organizations have to deal with the complexity of a microservices jungle like Netflix (pictured below), but even pre-microservices client-server applications often had multi-tiered approaches where latency is a significant factor, and a strong examination of things like network latency and proximity, storage latency, queue depth, horizontal and vertical scalability are important. In a microservices world, examination becomes even more critical, and yet more important when hybrid- and multi-cloud topologies are considered.



An area in which a formal migration practice can be of strong assistance, as it can:

- Ensure a comprehensive inventory of applications
- Understand critical application dependencies
- Help plan application requirements on a private, public, or hybrid cloud architecture in a fashion that preserves optionality, increases agility and developer access and satisfaction, and controls costs

## **4. Not Understanding the Application Cost Drivers Associated with a Cloud**

Migration is initiated to meet various goals, which can be technological, financial, velocity/agility, for example. One major problem is a disconnect at the financial level between the cost of a server or instance, and the holistic cost of applications and data. Many organizations that shift from private infrastructure to public cloud have a relatively naive view of the costs, which largely falls on compute costs.

**These organizations gain agility and flexibility, which are big benefits, but often discover the true cost of their public cloud investment is significantly larger than expected, which falls into four categories:**

1. Higher than anticipated storage costs, possibly due to:
  - Overprovisioning storage for performance benefits
  - Larger than expected access or egress costs
  - The need to keep multiple copies of data due to the inability to access a single canonical copy across many systems or applications, or for backup & DR purposes
2. Higher than expected network costs, possibly due to:
  - Unaccounted-for costs to move data to/from partners, out to customers
  - The network costs associated with backup and DR efforts
3. Higher than expected costs due to the desire to maintain a higher SLA because:
  - They don't anticipate the impact that a lower-SLA or
  - No-SLA public cloud option will have on-service availability

4. Higher than expected people / tools costs because:
  - They are unable to use the people and processes they have
  - Need to retool or retrain staff
  - Need to replace existing software investments with investments compatible for a new platform

In short, applications are not servers or systems; and an overly compute-centric view of infrastructure costs causes reality to not match initial expectation post-migration.

## 5. Not Planning for the Future

It's tempting to look at a migration, especially a lift-and-shift migration, as a one-time event. However, your portfolio of applications, developer needs, and infrastructure requirements will continue to shift over time.

A holistic strategy will take into account future application plans, be that sourcing from vendors, developer preferences and software development strategies — especially application modernization plans — and geographical requirements.



# How To Approach Migration

There are several approaches to cloud migration. Below are the four major ones to understand the landscape of possibilities.

1. Lift-and-shift
2. Lift-and-extend
3. Hybrid extension
4. Full rebuild

## 1. Lift-and-Shift

Lift-and-shift is a simple proposition. Take your existing systems, migrate them directly into a cloud mostly as-is. The major problem with lift-and-shift on its own is that it may not deliver any cost savings unless your costs are disproportionately high — such as organizations paying the operating costs for small single-tenant datacenters. Even the apparent savings sometimes achievable with a public cloud selection evaporates when the full storage, network, backup, remote access, and other costs are fully realized.

The advantage of lift-and-shift is that it is technologically very straightforward, and therefore can be accomplished rapidly with a high degree of confidence in success. For an enterprise with a high percentage of workloads virtualized on VMware, a private cloud provider with a VMware offering and ability to cross-connect a small amount of colocation space - can often perform a lift-and-shift migration with nearly no disruption.

**The risks of lift-and-shift will limit your organization's ability to achieve:**

1. Cost savings
2. Increased agility
3. Opportunities for application modernization

To avoid these risks, select a provider that has an offering that gives you strong hybrid- and multi-cloud optionality and has distinct reference architectures for building applications across multiple clouds.

### **These providers will tend to have:**

- Presences in the major public cloud markets (such as Silicon Valley, Northern Virginia, Portland)
- Strong relationships with the major datacenter colocation providers, such as Equinix and Coresite
- Maintain presences in major non-public-cloud markets with significant IT presences, such as New York and Los Angeles

### **Experienced providers will be able to help with:**

- Professional services for assessment, architecture, planning, and execution of the migration
- Managed services fill any gaps in your organization that limit the ability to operate your cloud environments
- Deep infrastructure expertise, in particular the network aspects that empower hybrid and multi-cloud use cases

## **2. Lift-and-Extend**

A variant on lift-and-shift is to shift an application to a cloud, often a public cloud, but not simply “as is”, but leveraging some cloud capability. An example might be to push an application to the cloud but replace a database server with a database-as-a-service element. One key factor to consider here is how the full spectrum of applications integrate with one another.



Although pure lift-and-shift can offer significant cost savings by being faster and easier to complete, some applications will benefit from a lift-and-extend approach. It is advisable to have an application assessment, and work with a partner that has significant hybrid extension capability.

### **3. Hybrid Extension**

Some organizations opt to simply extend their reach into the cloud. Services like VMware Cloud on AWS offer turnkey access from existing on-premises functionality into clouds. Some organizations may already have hosted private cloud, managed hosting, or colocation, yet opt to do much of their net-new development in public cloud, while keeping existing application in place.

### **4. Full Rebuild**

Some companies opt to rebuild for the cloud. One team is in charge of keeping the lights on, while development focuses on rebuilding applications in full for the cloud. This tends to be a choice only selected by organizations heavily focused on deep consumption of cloud-specific platform options, like serverless computing platforms such as AWS Lambda or Database-as-a-service (DBaaS) options.

This choice is obviously the most costly and time-consuming, but it can be justified when organizations see their applications as the key piece of their organization. An assessment is key for this option, because some organizations that want to pursue the “full rebuild” path do not fully assess certain aspects of the strategy, such as data migration, which remains as a need even if the applications are not to be “shifted” to the cloud.

Some find they can benefit from a dual strategy, by scoring a quick win with a lift-and-shift effort to be followed by a full rebuild, since in many cases the motivations and benefits between those two approaches are almost entirely distinct.

# Why Partner With Faction

With nearly 10 years of experience building, migrating and managing VMware cloud environments, Faction is one of VMware's largest cloud service providers and we have seen it and done it all.

- We've faced the strangest technical problems
- We've done weird migrations
- We've uncovered the "gotchas" of the migration process and planning
- We've built a Cross-Cloud Platform to support hybrid and multi-cloud

Our team of cloud strategists, architects and engineers can work with you to find the best fit for your workloads in either our own VMware Clouds, VMware Cloud on AWS, Native AWS, or other 3rd Party Clouds. We'll help deliver rapid transitions, extremely non-disruptive migration, and significant cost savings over both on-prem and pure public cloud. We'll assess your current infrastructure and applications, design a migration plan, and ensure you have the expertise and management assistance on-hand once you're in the cloud.

## Turnkey Hybrid Cloud

Faction is one of the leading private cloud and cloud-based storage providers in the United States. Organizations with tens of petabytes of data rely on us as a cost-effective alternative to expensive public cloud options. Because of our patents and expertise in hybrid- and multi-cloud, our cloud environments come “hybrid- and multi-cloud ready”. We stand behind our clouds with a **100% exit guarantee** - if you're not happy with us, we'll pay for the high-speed connectivity to help you move.

If you're looking for help determining if cloud is a fit for you - We can help!

Go to our website, [www.factioninc.com](http://www.factioninc.com), or click the button below to get started.

LET'S  
GET STARTED!