Migrating to the cloud for innovation and cost management

An expert guide for a secure and streamlined journey to the cloud
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Executive summary

Cloud adoption is top of mind for executives as the enabler of innovation across the enterprise. While moving to cloud is generally accepted as a good thing, it is critical that an organization proceeds with caution, as a single misstep can become costly and time consuming. Following a prescriptive approach to implementing a cloud program streamlines your transformation, accelerates time to value, and drives agility across the enterprise.

Businesses desire disruptive technologies that help them level the competitive playing field with smaller, more Nimble competitors. Through utilizing public cloud, they expect to accelerate development cycles by improving the speed to provision compute environments, often going from weeks to seconds. This enables the company to respond to market demands quickly, using DevOps and a Continuous Innovation/ Continuous Delivery (CI/CD) pipeline to speed the build, package, and deployment process of the software lifecycle. They also look forward to significant savings on total cost of ownership (TCO).

Figure 1. TCO savings by industry per delivered projects
Our customers achieve an average of 40% cost savings with a public cloud consumption model over traditional on-premises environments.¹

¹ Average calculated over 800 cloud projects over the last five years by CTP delivery team

Typically, the approach starts with gaining consensus throughout your organization. It includes assessing existing applications and processes and understanding the complete landscape. Doing so will help you to build, migrate to, and operate in cloud environments faster and with fewer issues.

This blueprint outlines proven steps an organization can take to meet that goal. It reflects the expertise of HPE Pointnext based on innovative cloud migration solutions and services derived from Cloud Technology Partners methodologies.

**Figure 2.** Five phases of cloud adoption
Challenges

The inflexibility of traditional infrastructure is inhibiting today’s business and IT agility. Hardware provisioning and maintenance tasks are costly and time consuming. Business teams, and their supporting developers, want a software-defined infrastructure that enables an agile delivery model. Migrating to the cloud addresses these issues, but the migration itself can face major challenges, such as:

- **Lack of corporate commitment to the resources and organizational changes required to make a measurable difference.**
  Cloud adoption is a strategic investment that will affect nearly every aspect of your organization. A lack of full corporate commitment will result in siloed organizations. If you don’t protect the organization against blockers and conscious resisters, there is a higher chance that the cloud project will fail.

- **Overlooking value drivers, including IT optimization, accelerated time to market, improved productivity, and other intangible benefits when justifying cloud migration.**
  Many enterprises do not take the time required to determine the complete business case for moving to the cloud. To understand the full value of cloud for your enterprise, you must look beyond the CAPEX versus OPEX benefits and assess the other value drivers at play.

- **Latency, support, and data volumes affect cloud compatibility; an insufficient understanding of data and application mappings and dependencies can cripple cloud programs.**
  Not all applications can move to the cloud due to challenges including latency and volumes of data being transmitted through the network. Some applications may need to remain on-premises for support, performance, or compliance reasons.

- **Most organizations don’t know where to start and what the shortest path is to extract value from a cloud migration.**
  Using a minimum viable cloud (MVC) methodology lays the foundation for a valuable and smooth migration.
A guide for a secure and streamlined journey to the cloud

Organizations want assistance dealing with these challenges because they lack the resources and expertise to address them. HPE Pointnext has delivered over 800 public cloud migration engagements and offers proven methodologies and IP to safely and predictably get you to your destination. Our prescriptive yet flexible, step-by-step process is road-tested and backed by our global professional services team. This guide focuses on migrating your company to the public cloud. Each business challenge is addressed through a guiding principle that includes an overview, a checklist of best practices, and expected results—all focused on migrating you successfully to the cloud.

Cloud-first is the mindset that all of your applications and data will move to the cloud unless there is a compelling reason to stay on-premises.
Guiding principle 1: Make a cloud-first commitment

BUSINESS CHALLENGE BEING ADDRESSED: Lack of corporate commitment to the resources and organizational changes required to make a measurable difference.

BRIEF DESCRIPTION OF THE GUIDING PRINCIPLE: Maintain a mindset that all applications and data will move to the cloud unless there is a compelling reason to stay on-premises. Start by gaining acceptance throughout the organization. Then, leverage HPE Transformation Office for Cloud to help establish a road map. Part of the process involves the establishment of a cloud business office (CBO) that is comprised of representatives from every aspect of your organization.

Without a cloud-first strategy, you are not giving your application and data teams the resources, nor prioritization to successfully implement a cloud project. When this happens, the results are marginal at best since there is no focused dedication to make the changes necessary to reap the full benefits of cloud. For a successful migration, you need dedicated teams and proper funding for your cloud program.

A cloud-first strategy follows a process that not only establishes a road map but also focuses on dedicating the appropriate resources to fully establish the organizational change required in a move to the cloud. It involves building a CBO to drive the program and processes, including program leaders, technical and security operations managers and architects, as well as legal, HR, procurement, financial, and business representatives.

With a cloud-first strategy, the entire focus of team members should be to get the enterprise to the cloud securely—not just performing minimal research with a proof of concept or pilot. A cloud team whose members still have their day jobs is a sure indication that:

- There is not a full commitment to cloud.
- The effort required is misunderstood.
- There is a lack of executive sponsorship.
The CBO is an essential component of successful cloud migrations. The organization should be responsible for defining a central set of processes for project management, technical decisions, and application owner onboarding. It can also set policies to guide supporting business units on investments in technology, training, risk, or security decisions, and organizational change management. The CBO centralizes standards in areas such as financial governance, operational services and governance, and vendor management. As a whole, these capabilities unify an organization’s approach to cloud adoption and enable efficient and innovative adoption.

**Figure 3. CBO**

A *cloud business office* (CBO) serves as the central point of decision-making and communication for your cloud program—both internal and external to your company.

**Figure 4. Achieving a cloud-first mindset**

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**Achieving cloud-first mindset**

- **Issues**
  - Opportunities
  - Strategy

- **Best practice**
  - Migration priorities
  - Integrated processes

- **Governance**
- **Compliance**
- **Security**
- **Development**
- **Operations**
Checklist

1. Invest in a workshop, bringing together all key stakeholders
2. Articulate why you are moving to public cloud
3. Stress a cloud-first mindset throughout the organization
4. Leverage the HPE Transformation Office for Cloud to establish a road map—complete with a CBO

Expected results

- Gain consensus, remove blockers, and align the organization
- Avoid team members heading in different and conflicting directions
- Achieve dedication among stakeholders to make the changes necessary to reap the full benefits of cloud
- Facilitate decision-making, communication, and culture for your cloud program, internally and externally

Figure 5. CBO stakeholders
A leading telecommunications company

<table>
<thead>
<tr>
<th>Business needs</th>
<th>HPE Pointnext solution</th>
<th>Customer outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Current operating model and organizational structure were not ready to support adoption and consumption of Amazon Web Services (AWS).</td>
<td>• Establish a CBO to provide oversight of the cloud initiatives and establish best practices for a federated cloud governance model</td>
<td>• Complete like-for-like migration not required—total server count reduction by 35%.</td>
</tr>
<tr>
<td>• Customer wanted to accelerate AWS adoption and application migration.</td>
<td>• Define and document standard and repeatable migration approach to AWS for dev/test, recommended migration toolsets, and common application reference architectures and patterns</td>
<td>• Scalable environment—increased parallel delivery.</td>
</tr>
<tr>
<td></td>
<td>• Support development teams throughout migration to reduce the time and cost associated and educate internal IT staff to be self-sufficient</td>
<td>• Faster environment or server ramp enables faster time to market.</td>
</tr>
<tr>
<td></td>
<td>• Define and implement operational capabilities in the areas of image creation and lifecycle management, CI/CD, services catalog, and security</td>
<td>• Innovative ways to try different UX patterns—test quickly with on-demand instances.</td>
</tr>
<tr>
<td></td>
<td>• Assist in the migration of 12 business-critical, client-facing applications</td>
<td>• Automated code scans for security with on-demand capabilities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minimized dependency on support—developers are now self-reliant.</td>
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Guiding principle 2: Know your cloud economics

**BUSINESS CHALLENGE BEING ADDRESSED:** Overlooking value drivers, including IT optimization, accelerated time to market, improved productivity, and other intangible benefits when justifying cloud migration.

**BRIEF DESCRIPTION OF THE GUIDING PRINCIPLE:** When building a business case for the cloud, it’s integral to define both your ROI and TCO benefits in the cloud. The difference between a TCO and an ROI analysis is that a TCO defines spending and savings, whereas an ROI determines what value is generated while taking spending and savings into account. It’s critical that you understand both, and their differences in order to effectively define the full value of cloud for your business.

Cloud initiatives often start as shadow IT, for business units requiring better agility than central IT can provide, given their physical hardware inventory. As usage grows, compliance and IT become concerned over governance and security. They use the cost savings (TCO) analysis over internal or outsourced infrastructure and associated costs to build a business case to define a future, broader cloud strategy.

Once companies migrate, they are able to reaffirm that although hard savings justified the hybrid approach to compute, the real benefits are found in soft savings, coming full circle to why businesses adopted cloud in the first place.

When building a business case for the cloud, you must obviously take TCO (hard cost savings) into account and compare like-for-like. This includes equipment and infrastructure costs, costs for downtime (planned, unplanned, and disaster recovery or continuity), service-level agreement (SLA) penalties, operational costs, and costs for upgrades and new products.

However, to understand the full value of cloud for your enterprise, you must look beyond the CAPEX versus OPEX benefits and assess these other value drivers at play. Most cloud ROI calculations don’t factor in agility or fully capture the costs of poorly utilized hardware. Many enterprises have an average x86 server CPU utilization between 8% and 20%. As a result, enterprises are spending much more on compute and storage than what is required.

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2 “10 Ways to Reduce the Cost of Acquiring Servers,” Gartner, Inc., 2017
Other soft value drivers that are often overlooked in typical ROI calculations include accelerated time to market, improved developer productivity, decreased provisioning time, and many more of the intangible benefits of cloud.

While soft costs can be hard to quantify, they are important to discover since they contribute to strategic business advantage. Those can include improvements in productivity (person days), accelerated application development, and software lifecycles. Enabling advanced development techniques, such as fast fail and automated error management, are also key factors. You must have the whole picture in mind when justifying the economics of your cloud migration.

Table 1. Hard versus soft savings

<table>
<thead>
<tr>
<th>Hard savings</th>
<th>Soft savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduced spending on compute, storage,</td>
<td>• Reuse of services and applications that allow you to define and redefine</td>
</tr>
<tr>
<td>networking, and security</td>
<td>solutions using the same cloud service</td>
</tr>
<tr>
<td>• Avoidance of hardware and software purchases</td>
<td>• Increased developer productivity</td>
</tr>
<tr>
<td>(CAPEX)</td>
<td>• Improved employee morale based on the use of cloud-based resources</td>
</tr>
<tr>
<td>• Reduction in operation costs, backup, and</td>
<td>• Ability to change business processes quickly around new and emerging</td>
</tr>
<tr>
<td>DR/DC</td>
<td>opportunities</td>
</tr>
<tr>
<td>• Reduction in operations-oriented personnel</td>
<td>• Increased global reach</td>
</tr>
<tr>
<td>or costs</td>
<td></td>
</tr>
</tbody>
</table>

Once companies migrate, although hard savings justify the hybrid approach to compute, the real benefits are found in the soft savings.
Avid, a leading provider of audio and video technology

**Business needs**
- Reduce annual operating costs and improve efficiencies by modernizing IT operations through the implementation of a virtual private cloud (VPC)
- Redesign and automate data center operations in the cloud
- Migrate corporate applications from Savvis to AWS
- Provide on-premises backup storage in AWS

**HPE Pointnext solution**
- Installed AWS Storage Gateway/VTL
- Defined and implemented an AWS tagging scheme to facilitate the analysis and management of AWS resources
- Used CloudEndure to replicate both physical and virtual servers to AWS

**Customer outcomes**
- Reduced IT operation expenses by 50%
- Automated BAU operations
- Established a migration factory to move approximately 138 servers to AWS
- Provisioned AWS Direct Connect by AT&T NetBond MPLS service in 2 weeks instead of 12 weeks with a dedicated circuit
Checklist

1. Involve members of your finance team throughout your analysis
2. Look beyond the CAPEX versus OPEX benefits and assess other value drivers at play forcing additional costs meant to address scalability requirements
3. Quantify agility
4. Analyze both tactical and strategic values, looking at hard and soft costs separately

Expected results

- Proactively identify cloud ROI to streamline cloud initiatives and lead to greater success.
- Quantification of real requirements allows cloud capabilities to take on peak requirements.
- Being able to quickly solve business problems, without waiting for product procurement and installation, opens up new opportunities and avoids compliance penalties.
- Soft savings, such as operational efficiencies and improved customer satisfaction, can often prove even more valuable than clouds’ hard savings.
Guiding principle 3: Discover the inner workings of your application estate

**BUSINESS CHALLENGE BEING ADDRESSED:** Latency, support, and data volumes affect cloud compatibility; an insufficient understanding of data and application mappings and dependencies can cripple cloud programs.

**BRIEF DESCRIPTION OF THE GUIDING PRINCIPLE:** Using discovery automation and profile tools to assess your applications and their dependency mapping not only helps ensure the right applications are migrated successfully but also enables your organization to take full advantage of the benefits and automation of the public cloud.

Not all applications are well suited for the cloud. Public cloud environments like AWS, Azure, and Google™ are not fully backwards compatible. Some of your applications are simply not going to be able to move to the cloud. It is uncommon for organizations to really know the inner workings of their application estate. However, without a solid understanding of what the connections are and how much data travels between your applications, your cloud migration will have limited success.

To determine which can and which can’t, it’s important to have a complete understanding of the application mapping and data volume between application dependencies. Depending on the importance of these applications, there will likely be a hybrid cloud network whereby the public cloud provider is connected through a private network link. In this mode, cloud-based applications can access legacy on-premises services while still gaining the benefits of a cost-efficient and agile infrastructure.

Some applications will not move to the cloud. Depending on the importance of these applications, there will likely need to be a hybrid cloud network.
HPE Right Mix Advisor

What is HPE Right Mix Advisor?

It is IP of HPE Pointnext that aids the consultant in the assessment and mapping of applications to the cloud.

- Digital platform and interview engine to collect, quantify, and rationalize assessment inputs, which lead to actionable consulting recommendations
- Automated rationalization and decision engine for cloud platforms and services to enable optimized workload placement into enterprise migration targets
- An automation of what we have learned from doing assessments in large transformation projects with customers, which embeds our sales, consulting, and delivery methodology
Checklist

1. Use discovery tools to identify the connections between virtual machines (VMs), the frequency between service calls, and the volume of data moving between the VMs
2. Identify server and application dependencies and risks
3. Determine trade-offs and opportunities for application migration
4. Create a full-scale migration plan

Expected results

- Information acquired establishes a data-driven migration plan to help optimize performance and reduce risk.
- Information gathered helps to determine the migration strategy, trade-offs that may be necessary, rightsize the resources required, and estimate the run rate of resources in the cloud.
- The capabilities you require can still be offered, in some cases, through modernized and improved methods.
- With a plan in place, you won’t be hit with any surprises.
Guiding principle 4: Build a minimum viable product (MVP) with the MVC methodology

BUSINESS CHALLENGE BEING ADDRESSED: Most organizations don’t know where to start and what the shortest path is to extract value from a cloud migration.

BRIEF DESCRIPTION OF THE GUIDING PRINCIPLE: Create an MVC. Based on the concept of the MVP, the MVC is the starting point of your first production cloud. Designed for organizational efficiency and to demonstrate the viability of cloud services, it is the platform that you iterate and improve on as you migrate to the cloud.

Cloud adoption has an enormous impact on your company, evolving processes that have not been seriously touched in decades thus necessitating organizational change initiatives and executive buy-in.

Figure 8. Process for developing MVC

Understand requirements of and impact on core IT systems and practices

Define the MVC

Select pilot application

Perform a gap assessment

Automate processes

Include Hub and Spoke services

A manageable project that tests all processes

Help ensure security of cloud environment

Plan for continuous compliance
If an organization is just beginning their cloud journey, they often don’t know where to start or even have the resources to do so. Because cloud adoption has such an enormous impact on business processes that have not been touched in decades, it requires executive buy-in from the outset. When cloud leaders fail to get all stakeholders onboard, when it’s time to roll into the cloud at scale, the non-IT stakeholders simply put the brakes on migration. They need help outlining the shortest path to value in order to gather support and get the proper funding in place to support it.

Based on the concept of MVP, the MVC is the starting point for a first production cloud. It is a secure public cloud environment running at least one client application and is designed for organizational efficiency, demonstrates the viability of cloud services, and engages the necessary stakeholders. It is the platform used to iterate and improve throughout a cloud migration and is key to unlocking mass migration to public cloud across the organization.

An MVC looks at the aspects of the application, associating important metadata, such as application entry points, SLAs, personally identifiable information (PII) status, compliance, and other risk-related information, in a way that enables the team to decide how to migrate the selected applications. The team can then identify server and application dependencies, identify risks, and determine the migration strategy. As part of the migration plan, the team can determine trade-offs and opportunities, and rightsize resources in the cloud. This is critical in the MVC pilot.
A Fortune 500 healthcare company

**Business needs**

- The upcoming expiration of the data center lease lead to an opportunity to fast-track its cloud initiative for the organization’s main application, a web-based connectivity platform for in-home patient care.
- Migrate European data center applications and workloads to AWS.
- Plan to expand globally in multiple regions.
- Need to maintain security requirements to stay in compliance with Class II medical devices and Health Insurance Portability and Accountability Act (HIPAA) standards.
- Reduce resistance to change across departments.

**HPE Pointnext solution**

- Identify nonfunctional requirements and cloud architecture
- Evaluate security assessment and vendor evaluations for third-party tooling
- Implement multiple POCs on AWS to prove high-risk areas of platform migration and to demonstrate ability to do rolling updates without downtime
- Stream representative institution data in standardized formats (HL7)
- Make highly available and reduce single points of failure
- Develop road map and effort or cost estimates for MVC implementation
- Implement and utilize Jenkins, Chef, CloudFormation, Bitbucket, Tcat, Axeda, Liferay, RabbitMQ, Talend

**Customer outcomes**

- Two standing POCs on AWS utilizing a microservices architecture
- Multiregion stack deployment; full infrastructure as code in Ireland, and Seoul, South Korea
- TCO justified costs for next phase of migration
- 32%—3-year reduction in TCO
- $5.1M total 3-year cost savings
- $1.5M 3-year project compute savings
- Time of software releases reduced from eight hours to minutes
- Ability for on-demand dev/test environments
Checklist

1. Define an MVC comprised of Hub services (common or core services) and Spoke services (line-of-business applications).
2. Select the right pilot application for your MVC. It should have sensitive data, fewer than 10 servers, can be simply lifted and moved, and is owned by a committed-to-cloud team.
4. Plan for continuous compliance with automated software that constantly looks at your environment, controlling the consumption and usage of services in your cloud.

Expected results

- Manageable, but meaningful, projects that help test processes more efficiently.
- Organization efficiency with right pilot application. When it comes to migration of 50 to 100 applications, the organization knows what to expect.
- Comparing control objectives against the CSA’s matrix and documenting the gaps help ensure a more secure cloud-computing environment.
- Management of profiles with consistent, repeatable outcomes with fewer errors, compliance maintenance, and reduced security risks.

Figure 9. MVC Hub and Spoke
HPE Pointnext approach for a secure and streamlined journey to the cloud

Moving to the cloud is the single most significant technology shift your company will face over the next decade. HPE Pointnext, with cloud competencies derived from Cloud Technology Partners (CTP), is your trusted advisor on this journey. From strategy to operations, HPE Pointnext accelerates cloud adoption with superior services, software, and intellectual property available on the market. Our Cloud Adoption Program (CAP) helps you achieve business results faster, no matter where you are in your cloud transformation. The best practices for cloud migration, described previously, are just one component of the journey. Guides such as this are available to assist you in various elements of your public cloud journey.

From the onset, HPE Pointnext engages your team in an agile framework that is iterative and cooperative. We collaboratively advise, define strategy, develop road maps, design, architect, integrate, and transform, so you have the resources you need to be successful. HPE Pointnext helps you get from where you are today to where you need to be with experienced, knowledgeable, professional services that help you:

1. **Prepare** your company for a migration to the public cloud
2. **Assess and plan** all aspects of the migration
3. **Build** MVC and processes for full-scale implementation
4. **Migrate** applications, processes, and procedures
5. **Operate** completely in the cloud
Our CAP is a transformational prescriptive framework that brings together leading technology, automation, services, and best practices. The CAP framework has been refined over a period of years by using the framework in engagements and adopting an uninterrupted improvement process. CAP enables enterprises to quickly and more easily realize the benefits of adopting cloud. It promotes fundamental change, addresses a broad perspective of key stakeholder needs, and provides results.

The Application Migration Framework (AMF) is an extension to the CAP. It is developed to address the multiple challenges and use cases associated with the migration of large portfolios of enterprise applications in a short period. AMF addresses the challenges of scale, velocity, complexity, safety, and viability for any migration project with a prescriptive framework, including a set of methodologies, superior tooling, and specific practices called enablers.

Normally, it takes years to develop and refine the knowledge, skills, tooling, and processes to quickly and efficiently migrate large portfolios of applications. The AMF value proposition is a simple one—AMF enables institutions to reduce the time to migrate an application. When you are considering migrating large numbers of applications, the cost savings are significant when reducing the time required to migrate an application.
Conclusion

Cloud-enabled enterprises can reap significant benefits, setting the foundation for disruptive technologies and realizing the full potential of cloud-enabled infrastructures. From strategy to operations, HPE Pointnext accelerates cloud adoption with superior services, software, and intellectual property. Our CAP helps you achieve business results faster, no matter where you are in your cloud transformation.

Our architects have been designing, building, and implementing IT solutions for clients across industries for an average of more than 20 years, and we’ve completed over 800 enterprise cloud transformation projects since 2010. From reference architectures that support multiple user communities to software that accelerates application migration, we’ve developed a full suite of tools that enable you to solve your cloud challenges more quickly and effectively. HPE Pointnext can also help blend your on-premises operations with your cloud infrastructure for a hybrid cloud environment that serves your needs. HPE Pointnext has the methodology, blueprints, and expertise to help you move to, innovate in, and operate in private, public, and hybrid clouds.

Figure 10. A cloud business office

Establish cloud standards and reuse; central point for decision

- Serves as the central point of decision-making and communication for your cloud program—both internal and external to your company
- Keeps sustained executive and sponsorship alignment
- Provides organizational clarity and accountability during your cloud migration

Enable collaboration; efficiently use cloud resources

- Risk and control monitoring—Monitor controls, risk, audit, regulatory, and compliance activities
- Financial management—Manage TCO, billing, and financial processes
- Third-party management—Manage third-party partnerships to leverage services effectively
- Product management—Align and source cloud services to match requests from business
Additional resources

HPE Pointnext

Learn more about migrating to the cloud by visiting The Doppler on best practices and expert advice for success in the public cloud.

Learn more at hpe.com/services/cloud