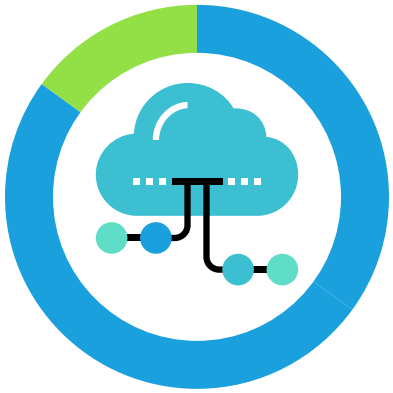
10 Tips for Enterprise Cloud Migration

Technologies once relegated to the pages of science fiction novels—artificial intelligence, digital currency, and self-driving cars to name a few—have become a reality. Enterprises must innovate with high velocity and at massive scale to stay competitive. Cloud adoption has become a strategic imperative for enterprises—it's the price required to transform into a digital business.

According to CloudEndure's 2017 Cloud Migration Strategy Survey Report, minimizing downtime, staying within budget, and performance impact on production are the top three cloud migration challenges.

According to the 2016 IDG Enterprise Cloud Computing Survey, 70 percent of enterprises have at least one application in the cloud.



RightScale's 2017 State of the Cloud Survey found that 85 percent of enterprise cloud strategies include multiple clouds.

Cloud migration strategies

There is no single path to cloud nirvana. That's why a multi-cloud strategy is important. The choices of public cloud, hybrid cloud, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and build or buy, can inflict analysis paralysis on even the best decision makers. Instead of going all in on a single strategy, enterprises should employ a variety of approaches to successfully move their IT environments to the cloud. Here are some of the most common strategies for enterprise cloud migrations.

- **Lift-and-shift:** Provision, import, and deploy applications and infrastructure resources to match existing, on-premises architecture without modification.

- **Re-architect and Refactor:** Update application components and middleware to utilize cloud services and patterns such as unlimited blob storage, distributed message queues, auto scaling, and managed databases.

- **Cloud Native:** Completely rewrite applications to make intelligent and efficient use of cloud services in a way that can’t be accomplished with traditional paradigms.

- **Reconsider:** For some applications, the cloud does not offer significant advantages; sometimes it makes the most business sense to leave those running in the corporate data center or even sunset them.

Cloud migration challenges

Like any technological solution, the cloud is not foolproof. Your organization will face many challenges along the way. Consider these questions before you migrate:

- Which applications should you migrate first?

- How will you monitor and minimize the impact on users before, during, and after?

- How can you continuously demonstrate benefits of the move?

- What training does your IT staff need to effectively build and operate cloud environments?

Fortunately, we've got you covered with 10 tips to help you minimize the risk and maximize the success of your cloud journey.

TIP 01 Truly Understand Your Applications' Architecture

Applications are critical to your business success, but they don't exist in a vacuum—they run on physical, virtual servers and containers, communicate across networks, sit behind firewalls, query databases, rely on middleware and interact with 3rd party systems using APIs (see figure 1). It is important to build a comprehensive understanding of your applications' architecture—every component, dependency, and integration—before considering a cloud migration.

This means ditching outdated, inaccurate architecture diagrams for solutions that can provide accurate representations of your IT environment. Part of understanding your applications' architecture is getting to know their performance characteristics and resource requirements—from CPU, network, memory, and disk utilization to latency, response times, and end-user experience, and even as far as how they contribute to your business and revenue goals. Performing a cloud migration without a detailed understanding of how your application is designed and built, the environment it operates in, and how it performs is risky and leads to costly overprovisioning and avoidable outages.

A Distributed Application Environment

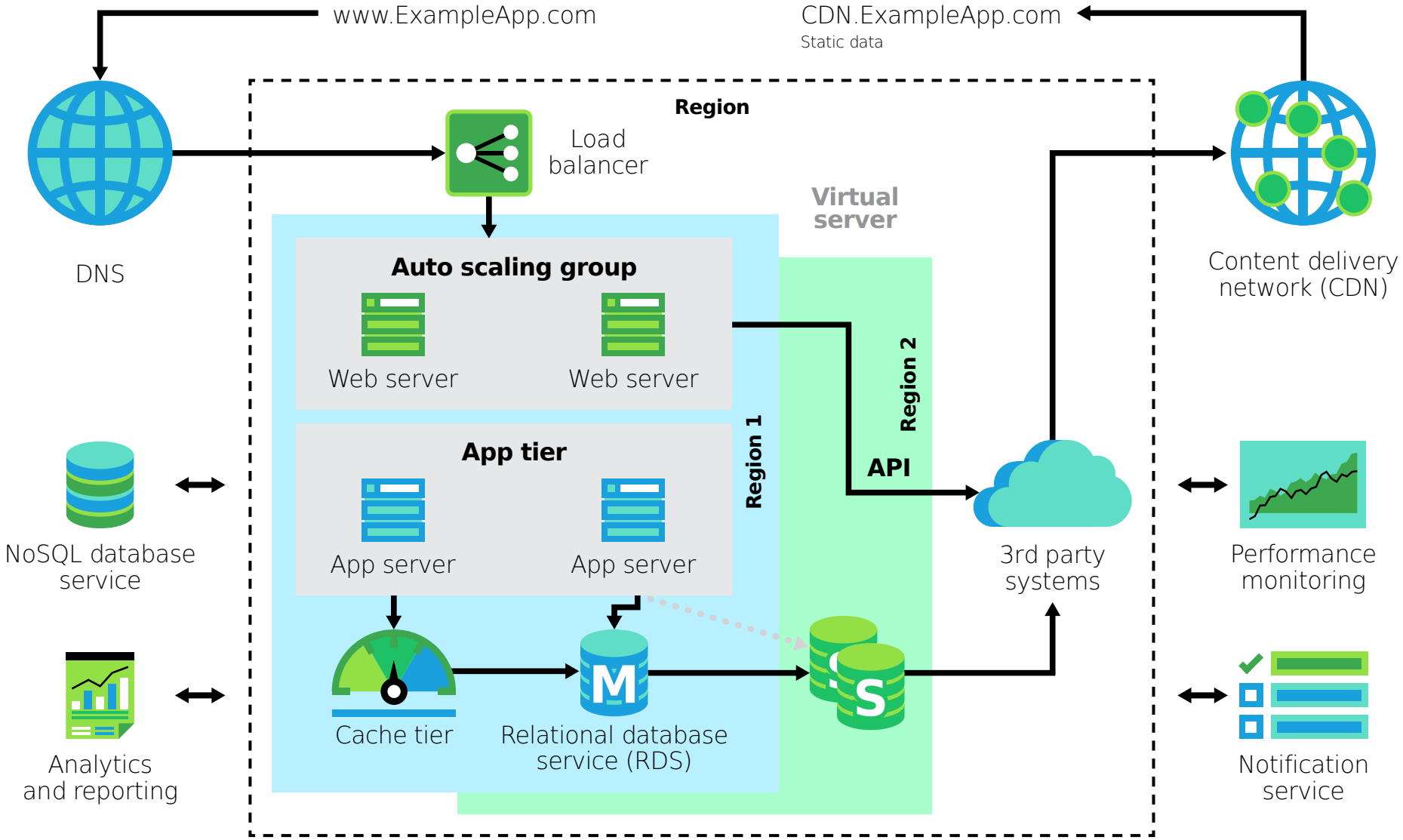


Figure 1: This diagram shows the network backbone, the distribution layer, and the access layer. The items above can be added or removed as needed.

TIP 02 Fix Any Performance Issues Before You Move

Once you understand your applications from an architectural perspective, it's time to prepare them for a move to the cloud. The cloud is not a silver bullet, and attempting to migrate applications with known performance issues only makes matters worse. For example, a memory leak in an on-premises application could break your budget when billed based on resource usage.

Before you move to the cloud, investigate and fix noisy alerts, eliminate false positives, optimize slow database queries, and smooth over erratic response times. Successfully migrating a healthy application to a new environment is a challenging engineering endeavor on its own. Migrating an application that shows signs of wear and tear is a recipe for disaster. By giving your application a tune up before moving it to the cloud, you can avoid outages and save your team from late night heroics.

TIP 03

Know How Users Gain Value From Applications

While understanding technical performance is important, knowing how users actually use and derive value from your applications is paramount. As you prepare to embark on your cloud journey, take time to engage your users - whether they are employees who use internal applications to perform their job functions or customers that depend on your applications to access digital services.

Combine your research with user or customer journey mapping and key transaction discovery to gain a holistic understanding of the value an application and associated services provide. A deep knowledge of your software value stream proves indispensable when you prioritize which applications to migrate, in what order, and what key user interactions need close monitoring during the migration process. Understanding applications from a user and business outcome perspective is vital to develop and articulate the business justification for cloud migration.

TIP 04

Check That It’s Easy to Access Key Cloud Provider Metrics

If you are moving to the cloud, don’t let cloud provider promises of infinite capacity and unprecedented reliability lure you into complacency. The cloud is dynamic: with a few minutes and a few simple service calls, you can accomplish what once required change requests, purchase orders, physically racking and plugging in equipment, and months of engineering effort. And like any other technology, cloud services can and will fail from time to time.

While cloud vendors provide programmatic access to a rich set of metrics and event streams, which allow you to automatically detect and respond to changes, these metrics are often not in context of the overall application's performance or business value. Because most traditional monitoring tools have limited or no support for the new class of metrics generated by cloud infrastructure. It's important to choose a performance monitoring solution that not only understands the cloud services being utilized, but also integrates and correlates these metrics with the application and user experience.

TIP 05

Proactively Check User Experience During the Pilot

During the early phases of migration, it's vital to not impact your customers with performance or availability issues. This can derail migration activity and dent executive confidence. Put simply, your users should have no idea the application moved to a new environment. You should also demonstrate success early in the process, to inspire the belief and enthusiasm required to propel a cloud migration of enterprise magnitude forward.

Whether intermittent connectivity, sluggish response times, or outright bugs—nothing stalls cloud migration efforts more dramatically than a poor user experience. So skip the endless meetings, headaches, and skepticism by monitoring user experience in real-time and simulating user interactions for key journeys. One modern technique to keep tabs on user experience is synthetic monitoring, in which you continuously test your app's key transactions from multiple locations around the world to ensure your software and services are truly performant in all corners of the globe.

TIP 06

Prove the Migration Was Successful

Even after your initial migration effort, and with no noticeable issues, it is important to plan ways to demonstrate the benefits of the cloud both pre- and post-move. From a technical perspective, show the new application architecture and that Service Level Agreements are being adhered to; how you can configure auto scaling to absorb unpredictable traffic spikes; how server response times remain unchanged or even improved; and how taking advantage of multiple regions around the world reduces latency and improves the user experience.

Be sure to also demonstrate the benefits from a business perspective, especially for customer-facing applications. Show how engagement and conversion improves along with response times for key customer journeys through the application. While the benefits of the cloud are obvious to you, business colleagues require more proof, so make sure you highlight what your company gains from cloud adoption early and often.

TIP 07

Realize Cloud-Based Applications Require Modern Monitoring

As you re-architect and extend applications for the cloud, you will make use of many cloud provider services, such as container orchestration for microservices, cloud load balancing, auto scaling, blob storage, managed NoSQL databases, message queueing, and more. Being in the cloud doesn’t reduce the need for monitoring. In fact, the cloud demands a modern performance monitoring solution that understands the dynamic, ephemeral, and diverse nature of cloud workloads.

The performance monitoring solution you choose must be capable of everything you would expect from a traditional monitoring service, but also be capable of tracing distributed transactions through integrated services, monitoring container technologies, and correlating cloud infrastructure changes and events with traditional metrics. Lastly, modern monitoring must easily accommodate server and container instances that last only hours, minutes, or even seconds.

TIP 08

Prepare to Use Cloud Bursting for Instant Scalability

One of the major benefits of the cloud is the ability to scale up or down instantly. Cloud bursting is a technique that allows on-premise applications to provision additional resources in a public cloud when additional capacity is not available on-site, especially during times of peak demand (such as Black Friday).

By routing overflow traffic straight to the public cloud automatically, cloud bursting is a reliable method to prevent service interruptions for users. Another major advantage of burstable capacity is providers bill cloud resources on-demand, meaning you only pay for additional resources when you need them. If you don’t take advantage of cloud bursting to augment your data center’s capacity, then you won’t realize the full value of your cloud investment.

TIP 09 Ensure Applications Drive Business Outcomes

Whether your applications run in the cloud, on-premises, or in a hybrid environment, they must continue to fuel growth through rapid innovation combined with significant operational efficiencies. So don’t analyze cloud performance metrics in a vacuum. Not only is it important to correlate your apps’ performance metrics with customer engagement and revenue growth objectives, but it is also necessary to provide proper attribution to your variable cloud costs, especially with every new feature release.

If there isn’t sufficient customer demand and business value in migrating an application, it may not be worth moving at all. You may also discover features that are no longer useful and need a refresh. The primary motivation for enterprises to move to the cloud is to accelerate growth through increased agility, unlimited scalability, and reduced costs—so ensure applications get these benefits.

TIP 10 Plan For a Multi-Cloud Strategy

Every cloud has unique benefits and drawbacks, but unlike traditional data centers, you don’t have to go all-in on a single cloud provider, nor should you. Enterprises have every kind of application imaginable: static, compiled languages like Java; dynamic, interpreted languages such as Node.js; web, mobile, and internet of things (IoT)-based apps; big data, machine learning and artificial intelligence algorithms; ephemeral, elastic build clusters; high-performance legacy, monolithic, and transactional business applications; distributed, fault-tolerant, highly-available, global scale social apps.

By adopting a multi-cloud strategy, you can leverage different clouds for different applications and workloads. Performing the monitoring and analysis required to select the optimal cloud for each application will make a huge impact on your bottom line. Enterprise cloud migrations happen over time and in phases. You don’t have to finish where you started, nor do you have to stay with a particular cloud provider when customer growth and demands push your applications to the limit.

Next Steps

Equipped with these 10 tips, we hope can start realizing the full potential of the cloud for your organization. Whether you migrate a pilot application, bring in a team of solutions architects, or task your tech leads with building a cloud competency, these principles and practices can guide you through a cloud migration that transforms your business and delights your customers. Remember to collect the necessary data, analytics, and insights to inform your strategy and demonstrate your success along the way.

Migrate Applications Quickly and Successfully With Application and Business Performance Monitoring

AppDynamics provides a powerful platform to manage application performance across multi-cloud environments, monitor user experience so users aren't impacted by re-architecture, and prove the business benefits of multi-cloud strategy. Visit http://www.appdynamics.com/cloud and try our free trial to learn how to speed up cloud migration with confidence.

Try our free trial to learn more and speed up cloud migration with confidence.


APPDYNAMICS