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Your Three-Step Guide To Planning Cloud Migration

Be Cautious About The Macroeconomic Lure Of The Cloud Sirens

by Lauren E. Nelson
May 11, 2016

Why Read This Report

Cloud migration has exploded in popularity since General Electric's (GE's) flashy keynote at Amazon Web Service's (AWS's) re:Invent in September 2015. GE claims to be migrating all workloads not containing secret information. Enterprises are revisiting public cloud and exploring whether existing or systems-of-record applications have a place in that world. Infrastructure and operations (I&O) professionals on this path should avoid a one-size-fits-all approach to outsourcing and migration plans, opting instead for an app-by-app assessment.

Key Takeaways

Assess The Value Of Cloud Migration
Migrating an application isn't cheap, especially if there's little value. Evaluate your entire portfolio of applications and migrate the best candidates first, leaving the least suitable for last. This latter set will probably never migrate, and that conclusion should be acceptable to all parties.

Pick A Migration Approach
If an application appears to be a good migration candidate, you have plenty of paths to that goal. Assess each application to determine the best path for each. The wrong path will cost you in many ways. The right path will be quicker as well as cheaper and will offer better performance.

Put Together Your Dream Team
The people you need to succeed at cloud migration are rare. They are likely not the same technologists you've had for years. Retrain where you can, but invest heavily in the right skills wherever you can obtain them. Don't skimp — that investment will pay handsome dividends.

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Notes & Resources

Forrester analysts collected information received during client inquiries and end user interviews as a foundation for this report.

Related Research Documents

Brief: Systems Of Record Projects Are Poised To Drive New Cloud Growth

Brief: The Cost Of Migrating An Enterprise Application To A Public Cloud Platform

The State Of The Cloud: Migration, Portability, And Interoperability, Q4 2015

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Beware Of One-Size-Fits-All Public Cloud Outsourcing

For the past five years, cost savings for variable workloads, scalability/agility, and geographic presence drove public cloud adoption. Most cases were net-new applications or total application rewrites. In fact, public cloud use cases for cloud migration and systems of record have been rare. Simply put, systems of record apps cost too much to move and promise little additional value for your efforts. But in 2015, this topic reemerged with great fervor. For the first time, enterprises are looking beyond public cloud as a unique economic model or scalable infrastructure — it's simply their outsourcing solution of choice.

> "We're taking a macroeconomic approach to our cloud strategy. It makes a lot more sense to not be in the data center business, rather than doing a microeconomic analysis on an app-by-app basis."
> (CTO of large financial services company)

Outsourcing's Dangerous "Your Mess For Less" Model Is Risky In The Cloud, Too

This theory isn't a new one. It's the same pitch for general outsourcing and specialization — i.e., focus your talent and efforts on the things that differentiate your company. With increasing pressure to transform customer experience, process massive quantities of data, and leverage more-agile business processes, enterprises and I&O pros justifiably view outsourcing as imperative. What's new is Fortune 100 firms stating that public cloud will be their only outsourcing solution. Enterprises in this camp fundamentally believe that the overarching value gained outweighs cost, migration, security, and compliance issues. Forrester disagrees with this opinion. Public cloud will play a bigger part in your future infrastructure sourcing than you may have imagined; however, cloud is no panacea. If you overlook key considerations and decide to migrate your apps holistically, you'll suffer poor performance, costly redesign efforts, potential application licensing violations, and endless consultant fees. Although there's some truth behind the vendor management woes of multisourcing, the issues associated with cloud migration are far from solved:[1]

> › **Pricing still favors variability.** Reserved instances help optimize cloud platform spending but still remain higher than equivalent on-premises costs. Prospects to cut raw costs are exclusively tied to cloud storage and variable workloads.[2]

> › **Fixed costs don't go away.** Most existing costs won't disappear post-migration. You've likely got a long list of fixed costs unless a lease is up, a massive all-systems infrastructure refresh is underway, or the data center team consists entirely of contractors. When costs are fixed, outsourcing only increases costs. And repurposing resources is rarely easy.

> › **Poor performance may be a reality.** Cloud migration tools help with machine-to-machine (M2M) conversions and replication but don't address application architecture incompatibility. For some apps, this translates to diminished performance. Every app will require some adjustment, but a segment of them will require major rewrite efforts.

› **Migration isn't free.** You will likely incur a per-server cost for automated M2M conversion, a per-app fee for a readiness assessment, or a per-hour service charge for advisory services. Determining whether this cost is worthwhile will vary by app. The combined financial and performance sacrifices may not be justifiable for many of your workloads.

› **Security and compliance are expensive.** Although improved security is one of the top drivers for public cloud adoption, this covers only the underlying infrastructure.[3] Enterprises must ensure compliance across the full stack, which can be an expensive undertaking.[4] Cloud does not absolve you from security responsibilities. In fact, risks are far higher at the stack layers above the cloud provider's domain.

Take An App-By-App Approach With This Three-Step Process

Around 2011, enterprises started to recognize that an all-or-nothing approach to the public cloud was unwise. Certain applications greatly benefit from its scalability and per-unit pricing, while this approach negatively affects other workloads in terms of cost or performance. Ultimately, enterprises recognized public cloud as just one of many outsourcing models. They generally targeted net-new or reinvigorated applications for public cloud, while other sourcing solutions served the systems-of-record market. In 2016, the market is revisiting whether systems-of-record workloads might have a place in the public cloud, especially as traditional application hosting companies begin to replatform their managed services on public clouds. Evaluate each application for its best outsourcing fit.[5] For some systems of record, that will be public cloud. However, others will face explicit barriers that prevent migration or simply lack any added value over the incurred costs. For each application, answer the following three big questions:

1. **What's the value/cost of migration?** Migration is costly. If you're going to make the move, do an assessment to determine the benefits and costs. A key determiner will be the process required for each specific application. Realistically, a hosted private cloud environment may be a better fit for some.

2. **How will you migrate this workload?** There's more than one way to migrate an application. No single approach will work for all your applications. Profile each application to determine the right approach and the associated costs.[6] Replacing your app with a software-as-a-service (SaaS) alternative might be your best migration plan.

3. **Who will migrate this workload?** Even the most cloud-savvy organizations don't plan to migrate their applications alone. Tools can shortcut timely tasks. Services can fill the knowledge gaps within your enterprise's migration team. The first migrations likely require the most added support.

Step 1: Assess Your Application For Migration

Macro approaches to public cloud deployments will quickly lead your team into dead ends, significant spending, and performance issues, with questionable end value. Do a full portfolio assessment to understand each application's migration value and cost.

Weigh The Value

Rarely will cost savings be the driver for moving an application.[7] Although, in some circumstances, financial benefits exist, nonmonetary benefits more often drive the migration.[8] Start by identifying the value for each app. Some examples include:

› **Geographic presence.** If you're an international business with employees and/or customers worldwide, data center locality is important to mitigate latency and abide by local compliance requirements. Public cloud vendors can provide scalable locality for an application accessed across the world.

› **Sustainable development tools.** Public clouds invest in their ecosystems of services and partners that continue to deliver value and shortcuts for net-new development. Although this value mostly affects net-new development, it can enhance rapidly expanding existing applications.

› **Proximity to other applications.** This application ties into other cloud-based applications in use, and relocating it would either reduce latency or mitigate data-out costs.[9]

› **Better scalability.** Variable workloads benefit not only from the economics of public cloud but also in terms of performance. Public clouds are built to scale and to accommodate peaks in usage on-demand. Scalability benefits include cost, peace of mind, and performance.

› **Managed support from vendors.** SharePoint, enterprise resource planning (ERP), and healthcare apps all require massive resources and mental energy. External options usually come with specialize options that include managed services. Ultimately, this can remove a massive footprint from a data center while also generating a higher quality of service.

Measure The Cost

Forrester recently published a cost calculator for determining the cost of migration.[10] This calculator breaks down potential costs into the following high-level categories:

› **Migration planning and design.** Much of the effort, and thus cost, of designing and implementing the public cloud environment for the first migration project isn't repeated in the second, third, and subsequent projects. Examples include designing identity and security, network, and integrations that are useful to many applications. The efforts in the first project will pay future dividends. Break out this category of applications into a separate cost section.

›   **Labor costs.** Labor costs dwarf infrastructure and platform services costs in most of the migration projects we've reviewed with clients. Some big applications do incur massive cloud-subscription costs, of course, but those aren't the majority. The tool supporting Forrester's Cloud App Migration Cost Model accommodates both internal staff time and fees generated by agencies, integration firms, and similar external parties.

›   **Cloud service platform.** Don't forget to include cloud platform and services costs for the application once it has been migrated. To gain an accurate estimate, research cloud economics to understand the incentives behind horizontal scaling, per-hour variability, and reserved instances. Significant price transparency from the providers will support these efforts, but some components will be difficult to judge prior to your migration.

›   **Software licenses.** Some software doesn't translate well to cloud because the licensing model has not yet caught up with cloud infrastructure. Understand whether licenses are paid per-CPU, per-socket, per-core, per-server, or via some other factor that may be complicated by cloud's inherent compute abstraction.

Step 2: Select The Right Migration Model

There is no single approach to cloud migration, nor can an enterprise simply pick one migration model to meet all its migration needs.[11] A bad choice results in negative customer experiences, downtime, overspending, license violations, security vulnerabilities, and poor performance. A mistake may prove irreversible and irreparably damage the business (and your employment). Decide wisely. Continue the app-by-app assessment to determine the correct migration method. Here are your options:

›   **SaaS substitution.** Before evaluating methods for moving your existing application, look to the SaaS market for an acceptable alternative. Removing application-level support for commodity apps with high performance demands delivers higher value than simply rehosting it.[12] Maturity ranges drastically between application categories, so there may not be a suitable SaaS option.[13]

›   **Lift-and-shift.** Migration tools complete minor automated infrastructure conversions from your on-premises hypervisors to those in the public cloud. Just as it sounds, this method makes few to no changes to the application itself. This is one of the primary approaches for packaged or sunset applications with little to no modification.

›   **Lift-and-extend.** The most common cloud migration practice rehosts the application in a public cloud while making significant adjustments to it through services and use of the cloud platform. Enterprises use this migration approach for both custom and packaged applications.

›   **Hybrid extension.** Rather than physically moving an application, you can extend it. Build anything net-new in the public cloud and its various services, and keep the remaining portion on-premises, in a colocation facility, or in a hosted private cloud environment. If this is your approach, be wary of latency between sites.

› **Full redesign.** The final approach is a full, hands-on redesign effort, which is both time-intensive and expensive. Given this, reserve this approach for only a small selection of workloads. If you have a custom application that you've assessed as long-standing and high value, rewriting it to be cloud-ready (e.g., scalable and componentized) could optimize its performance. Top candidates require application language modernization and/or can take advantage of the economic model, scalability, or global presence of a public cloud. And lastly, packaged applications don't fit the mold. Eventually, your application provider will carry out this task, providing its application in either a hosted or SaaS form or sticking with a single version across its various deployment models.

Consider These Factors In Determining Model Selection

The work and investment required to migrate each workload will depend on its characteristics and future. Selecting the appropriate model will ultimately help inform the migration costs, prevent late overspending, and help mitigate performance issues. Answer the following questions to help profile each application and determine the best migration method.

› **Systems of engagement or systems of record?** Systems-of-engagement applications often require fewer changes and lower cost migration efforts, whereas systems-of-record workloads are far more complex. Where possible, a rewrite may be the best option. However, some of these applications can't, or shouldn't, be rewritten.

› **Packaged or custom?** Independent software vendors (ISVs) aren't incentivized to release cloud-ready versions of their traditional software. They prefer to sell you SaaS rather than rehost their applications onto infrastructure-as-a-service (IaaS). Although customers customize packaged applications, they rarely have the interest or ability to redesign the application for a cloud. If SaaS-replacement or dedicated environments aren't options, lift-and-shift may be the best choice, despite anticipated performance issues.

› **Monolith or microservices?** A microservice-based design makes Agile development in horizontally scaling cloud environments easier, more efficient, and higher quality.[14] But many enterprise apps are still monolithic. Monolithic applications often translate to expensive large virtual machines (VMs) and poor performance. They require application architecture adjustment with partial or significant rewrite support. The effort required will vary, depending on how heavily the services intertwine.

› **Promising future or sunsetting?** Applications with a short shelf life aren't worth a time-consuming migration effort and are key candidates for a lift-and-shift approach. If your application is old but likely to have a long and valuable future, undertaking a more involved migration might be a better fit.

› **High or low value?** Enterprises generally kick off their migration process with a rigorous application rationalization effort to minimize total apps to migrate. Even when rationalization is complete, some applications are more important than others are. For high-value applications, investing in high-performance or more-expensive migration procedures makes more sense than for low-value apps.

Step 3: Identify The Right Team To Migrate Your App

Possibly the hardest element of migration is determining your cloud migration personnel. There's no shortage of vendors with a range of tools and consulting services to accelerate this process. But this can quickly drive up costs. Leaders in this space develop an internal team that specializes in application architecture with cloud provider expertise. This team informs their real-time decisions. Although these enterprises use their teams for strategic decisions and application rework efforts, they still leverage tools where possible and look to outsource more-arduous development tasks. I&O professionals undergoing a cloud migration effort should:

› **Build out an application transformation team.** If the migration effort is sizable, developing a team to carry out the process will be key to success. This team will primarily be familiar with application architecture and performance but will also leverage expertise across security, operations, sourcing and vendor management, and each application owner. Fill gaps in this team with qualified vendor partners for either continued or temporary support.

› **Leverage tools and time savers.** When possible, leverage automated tools. Save the migration team's valuable time for strategy, application architecture, and nonautomated tasks. Similarly, using a vendor with migration expertise may jump-start the project and train the migration team far more quickly than solo attempts.

Design A Top-Notch Migration Team

Building new applications in a public cloud platform requires design knowledge, some cloud expertise, holistic management, and security support. When migrating systems-of-record applications, enterprises try to build out a team of individuals that bring a diverse set of talent. Some enhance their existing teams with external advisors and tools, while others look to hire new individuals to build out areas of weakness. Skills you need include:

› **Advanced cloud platform expertise.** Whether you're hiring this expertise or leveraging external advisors, a deep understanding of the major public cloud platforms and their surrounding services is important. Knowing what services are available may help avoid custom design efforts and long-term maintenance. If vendor lock-in is top of mind, your cloud advisors should be able to identify the differences between the solutions to help identify points of lock-in.

› **Application architecture knowledge.** Easier migrations will require minimal changes to an application. However, candidates for full or partial rewrite will require application architecture experience. Some enterprises describe their most arduous migration tasks as pulling apart monolithic applications into smaller microservices where they've pulled out any relevant code for each service.

› **Application owner participation.** Application owners of each application will likely not bring cloud expertise to the table, but they will know more about performance, customization, usage, and connectivity of this workload. Don't dig up this information; go to the source and include these owners in the relevant migrations.

› **Modern development best practices.** For applications that aren't candidates for lift-and-shift or SaaS-replacement, knowledge of the latest development best practices will help direct any new code. This expert should know the categories of developers within your organization, the latest market trends, and the ability to create sustainable development practices.[15]

› **Opportunistic tool usage.** Cloud migration is complex. You have no shortage of tools and services in place to accelerate certain steps. When automated tools provide high quality and fast completion, embrace the support. Don't be alarmed if it's supplied by a small startup. Look for reference customers and credibility acknowledged by large cloud platforms and knowledgeable advisors. These may be the most affordable and most capable tools in the market. Risk of acquisition or lack of company sustainability will have minimal impacts for a one-time migration.

What It Means

The Optimum Migration May Be No Migration At All

Cloud is undeniably a powerful tool in your technology services portfolio, but beware of overambitious desires to move everything to public cloud services. Yes, impressive enterprise thought leaders have made bold statements. However, migration strategies, in practice, don't actually follow a one-size-fits-all approach. Even the trailblazers take an app-by-app approach and find themselves faced with exceptions. Bold statements serve as a catalyst for a change in mindset rather than as a road map to follow. Ultimately, bold statements set the stage for a far more external-cloud-first (e.g., SaaS and public cloud platforms) approach to application hosting.

I&O professionals certainly should evaluate every application workload for its cloud suitability, but the folly of pursuing some migrations will quickly be obvious. The folksy and grammatically disastrous colloquialism "if it ain't broke, don't fix it" is simplistically wise and will apply at times. Focus your precious energy, people, money, and time on those migrations that will give you the highest rewards. Thought leaders tend to make bold claims but in reality take a far more cautious approach. Look behind the curtain before launching into a full-fledged migration effort. Moving everything to the cloud just because it's the cool thing to do is demonstrably not cool at all!

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Endnotes

[1] For advice on how you should approach the economic factors of cloud computing, see the "Brief: Top 10 Facts Every I&O Pro Should Know About Cloud Economics" Forrester report.

[2] For good breakdown of pricing across the major public cloud providers, see the "Understand Public Cloud Pricing Strategies To Save Money Today And Tomorrow" Forrester report.

[3] For an examination of motivating factors and chief concerns amongst North American public cloud adopters, see the "Adoption Profile: Public Cloud, North America, Q1 2016" Forrester report.

[4] Balancing security and risk is one of the facts outlined in the following report. See the "Brief: Top 10 Facts Every I&O Pro Should Know About Cloud Economics" Forrester report.

[5] Cloud services in the enterprise are growing, as customers increasingly want to get out of the data center business. While these services offer flexible new options for CIOs, infrastructure and operations (I&O) professionals, and other business and technology leaders, they pose new challenges in sourcing and ongoing administration, particularly as attention shifts to systems of record and multicloud destinations. Many customers not only take a cloud-first view of migration but also pursue a "public cloud or bust" strategy. I&O pros should use effective portfolio evaluation — including strategic rightsourcing — to identify the right providers and migration candidates. For more information, please see the "Portfolio Evaluation Is The Key To Migrating Applications To The Cloud" Forrester report.

[6] This report covers five common approaches to migrating systems of record to cloud. See the "Brief: Systems Of Record Projects Are Poised To Drive New Cloud Growth" Forrester report.

[7] A big uptick in client inquiries from application development and delivery (AD&D) professionals about moving core business systems to public cloud platforms augurs a new wave of cloud computing applications. Web and mobile applications — systems of engagement with customers — dominated the first wave of cloud adoption. The second wave will be propelled by systems of record and new analytics (systems of insight). For more information on this trend, please see the "Brief: Systems Of Record Projects Are Poised To Drive New Cloud Growth" Forrester report.

[8] For more discussion about potential motivating factors behind moving apps to the cloud, see the "Portfolio Evaluation Is The Key To Migrating Applications To The Cloud" Forrester report.

[9] The following report explains how colocation and interconnection providers improve your ability to deliver cloud-based applications by linking your services to partners in a cloud market. See the "Simplify Your Hybrid Infrastructure Strategy With Cloud Exchanges" Forrester report.

[10] The following report has a cost model that can help set expectations when it comes to both initial and ongoing migration costs for moving enterprise apps to the cloud. See the "Brief: The Cost Of Migrating An Enterprise Application To A Public Cloud Platform" Forrester report.

[11] This report examines an observed trend of enterprises moving their systems of record to public cloud environments. See the "Brief: Systems Of Record Projects Are Poised To Drive New Cloud Growth" Forrester report.

For an overview of various migration methods for moving applications to the cloud, see the "The State Of The Cloud: Migration, Portability, And Interoperability, Q4 2015" Forrester report.

[12] This report analyzes the longer-term, five-year cost of ownership and value for cloud applications across ERP and CRM applications. See the "The ROI Of Cloud Apps" Forrester report.

[13] With the greater prevalence of SaaS across applications categories, technology sourcing executives must help with researching solutions, piloting and purchasing, and contract negotiations. This report analyzes the maturity, adoption, and potential for business value for SaaS delivery models in key categories of enterprise applications. See the "TechRadar™: Software-As-A-Service, Q1 2014" Forrester report.

[14] Rewriting older applications is financially and pragmatically impossible, yet delivering new capabilities often requires organizations to wring new life from older applications. Modularizing and incrementally modernizing older applications provides organizations with the time and the means to keep older applications fresh and adapted to new purposes. For more information on microservices and applications, see the "Application Modernization, Service By Microservice" Forrester report.

[15] This report highlights the practices of dev teams that build, deploy, and support such applications — teams that are fluid and cross-functional and include business, development, quality assurance, and operations expertise. Companies that have mastered this approach are able to deliver innovative software solutions to customers at a pace inconceivable even just a few years ago. See the "Application Delivery In The Modern Age" Forrester report.

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