



To Rehost or To Refactor

Application-down
approach for cloud transformation

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Introduction

Interest in cloud migration has steadily increased at the rate of 60% year-on-year since 2015. Today, cloud migration has virtually become a universal requirement among organizations. Gartner finds that "By 2018, 50% of the applications hosted in the public cloud will be considered mission-critical by the organizations that use them".¹ Clearly, cloud computing is increasingly being viewed as the optimal vehicle to transform a company into a digital enterprise, and build agile and scalable solutions.

But the reality is that migrating to the cloud is not as simple as flipping a switch. As more and more organizations move to cloud, they face challenges with lift and shift/forklift migrations. These include losses in application functionalities and performance degradation resulting in a higher TCO. It has slowly come to light that forklift migration is not the best-fit solution for a cloud movement and an application-down approach has to be considered for cloud transformations. This research discusses the need for organizations to take a holistic bi-directional view of both applications as well as infrastructure in order to achieve a business-oriented, risk-free & high velocity transformation.

Insight 1

Commonly used cloud application transformation methods

After assessing the applications to be migrated, companies typically may choose from one of the following methods to migrate their applications to the cloud:

Rehost: Rehosting involves moving the workload to the cloud with as few changes as possible, by copying a virtual machine (VM) image or reinstalling the application in a pristine VM.

Refactor: With refactoring, applications are customized to run on the cloud or, rather, some components of the applications are replaced with cloud services by refactoring the services that compose the application code.

Rewrite: Rewriting can be a minimal rewrite or complete redesign of the application and its code to adopt cloud native microservices architecture.

Replace: Organizations may replace existing applications with an equivalent SaaS offering or with an equivalent IaaS-based marketplace offering.

Rehosting and refactoring are the most commonly applied cloud application transformation methods today. In the case of rehosting or the 'lift and shift' framework, the goal is to transfer the application to the cloud with as few changes as possible. Refactoring is one level higher than rehosting – only some components of the application are replaced with cloud services. For example, a self-managed relational database management system can be replaced with a cloud RDBMS service. Refactoring can also involve using non-intrusive, event-driven, server-less functions to extend functionality or solve integration problems. This newsletter considers how organizations target cloud transformation by using the refactoring framework, and defines the process steps to manage refactoring effectively, while outlining its benefits. While migrating to the cloud, it is essential to understand how the applications perform and scale in cloud, and focus on the long-term modernization and rationalization of legacy apps.

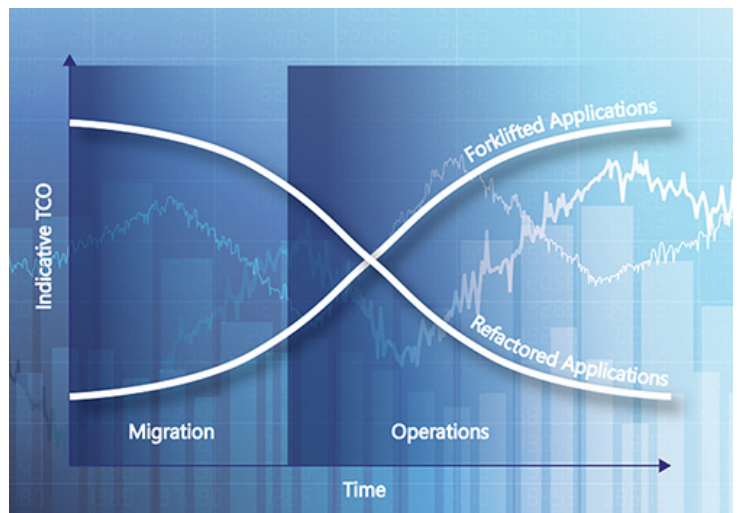
Challenges associated with lift and shift

The risk involved in the rehosting framework is that the VM might carry over inherent code vulnerabilities, inefficient resource usage patterns, or security weaknesses, because the transformation effort is minimal. In addition, if there are no changes to the application architecture, organizations might struggle to drive value from the scalability that cloud deployment is supposed to provide. Rehosting also necessitates assembling the entire application stack, which in turn requires a wider range of services to complete the migration. In addition, the risk that the VM image and management API is locked in, is also higher with rehosting. Rehosting of applications does not help organizations take into consideration the business or mission criticality of the applications, complexity of integrations, or data movement and usage for cloud migration.

¹Gartner Inc., *An Overview of Enterprise Cloud Strategy Approaches and a Pragmatic Template for Setting Your Cloud Use Policy*, 25 January 2017, G00317697

Refactoring provides advantages over rehosting

Refactoring applications for cloud transformation enables companies blend familiarity with innovation. Organizations may continue to use existing programming models, languages, and frameworks. In refactoring, the application code by itself is not refactored, but only the services that compose it. With refactoring, organizations can help developers reuse languages, frameworks, and containers they have invested in, so that the organization can also keep leveraging the code that it considers strategic. Rehosting is not ideal for business-critical applications that are inadequately designed. Without refactoring, such applications are likely to consume cloud resources inefficiently, leading to significant cost implications and performance issues as time goes by.



Source: Microland Limited

A major benefit of refactoring legacy apps is that it helps transform the business into a DevOps and agile technology mode for sustained benefits. Refactored and cloud native applications lead to greater efficiencies in the long term while reducing the total cost of ownership. (see Figure 1)

Complete refactoring typically ensures higher performance of the application, while applications can also be optimized to operate at lower costs. Refactoring helps redesign the application to benefit from the latest PaaS and SaaS-based technologies. Organizations that optimize applications by refactoring gain not only from lower costs and operational requirements, but also enhanced scalability and uptime.

When the ask is around application performance and end-user experience, performance and latency are proportional to the native code developed. While cloud-native application development is the optimal cloud migration approach, refactoring presents businesses an intermediate, cost-effective option. Ultimately, compared to rehosting, refactoring reduces risk and optimizes performance to drive higher ROI and service revenues

Insight 2

Ensuring execution rigor for refactoring

Refactoring requires a structured approach and thorough analysis of existing applications. Gartner recommends to "...be sure to apply program and project management formalisms and professionals to ensure rigor in defining and executing the migration, especially when the number of workloads is in the hundreds or thousands."¹

Cloud transformation services should include a cloud readiness assessment in addition to the application transformation to cloud. A standardized assessment framework for cloud readiness considers a number of factors including design, architecture, compatibility, security, performance, and business objectives. For application transformation to cloud, a well-defined methodology that includes application analysis, migration planning, migration, integration, and optimization of applications on the cloud is required. Ideally, applications are refactored for cloud fitment using technology and cloud service-agnostic expertise.

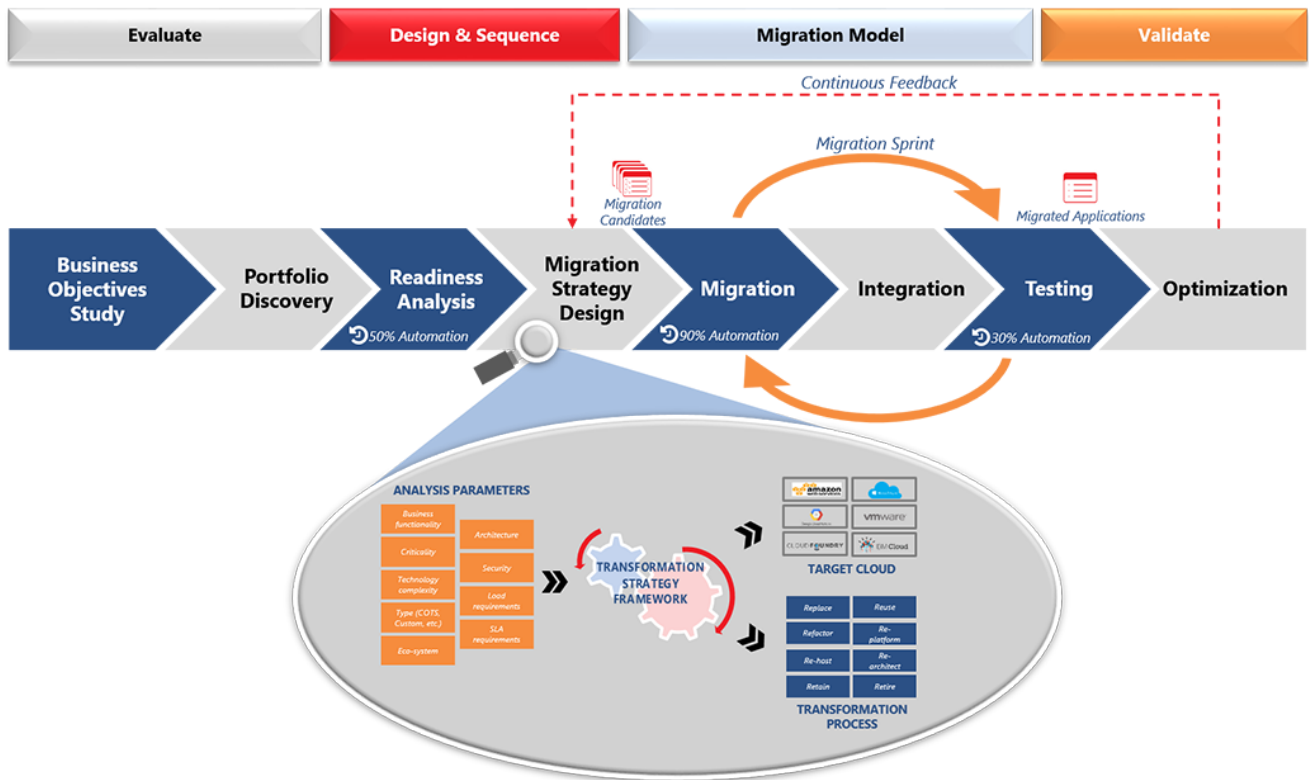
A standardized cloud transformation methodology involves three processes: evaluation, designing and sequencing, and migration and validation.

Evaluation

The evaluation process helps understand the organization's business needs, while defining the scope of the migration and identifying and estimating the application stack that is to be migrated. During this phase, the key stakeholders and the business pain points of the organization are identified. Finally, a portfolio discovery process helps assess the application stack, map the integrated tools and technologies, and collect the data required for the analysis.

Designing and sequencing

The designing and sequencing process involves the development of the cloud migration strategy, and the identification of the right cloud services provider based on the requirements and cloud strategy of each organization. As a first step, readiness analysis is conducted to assess the feasibility of the application technologies and prioritize the applications selected for cloud migration. The migration strategy design process defines the migration execution plan and shortlists the ideal migration processes and tool refinement options.



Source: Microland Limited

Migration and validation

The migration process should ideally execute the migration in sprints and validation should include testing at the technical, security, and business unit levels. In addition, this process should also ensure ongoing optimization. During the migration, the selected application functionalities are migrated leveraging the collected data, and the applications are fine tuned to optimize their performance. The integration process helps integrate the internal modules and external interfaces of the applications. Optimization ensures early life support, continuous monitoring, and optimization while gathering feedback on modifications to the migration plan.

An all-in cloud migration strategy should refactor by leveraging higher level cloud services

According to a Gartner analysis, "...it should also not be confused with a wholesale lift and shift of data center content onto third-party cloud infrastructure as that, in many cases, will not bring enough advantage to warrant the effort and risk of such a move (as moved applications do not become richer, more elastic or even less expensive by just moving them.² An all-in cloud strategy should not only lift and shift but granularly evaluate what to replace with SaaS, refactor by leveraging higher level cloud services, rebuild on PaaS, or reimagine completely.

²Predicts 2017: Cloud Computing Enters Its Second Decade, 2December 2016, G00311365

About the Author



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“Satadeep Mitra is the Vice President at Microland and leads the Digital Applications initiatives. As part of his role, he is responsible for building capabilities in the areas of digital application, data services, and DevOps services. He has over 17 years of experience in Technology and Financial Services industry with focus on technology outsourcing, globalization, industrialized services, business transformation areas. Satadeep holds a PGP degree from IIM, Ahmedabad and an under graduate degree in Mechanical Engineering from IIT, Kharagpur.”

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