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An Enterprise Cloud Maturity Model for 2018

This article serves as a valuable roadmap to anyone who is looking for direction on how to make their enterprise cloud-optimized.

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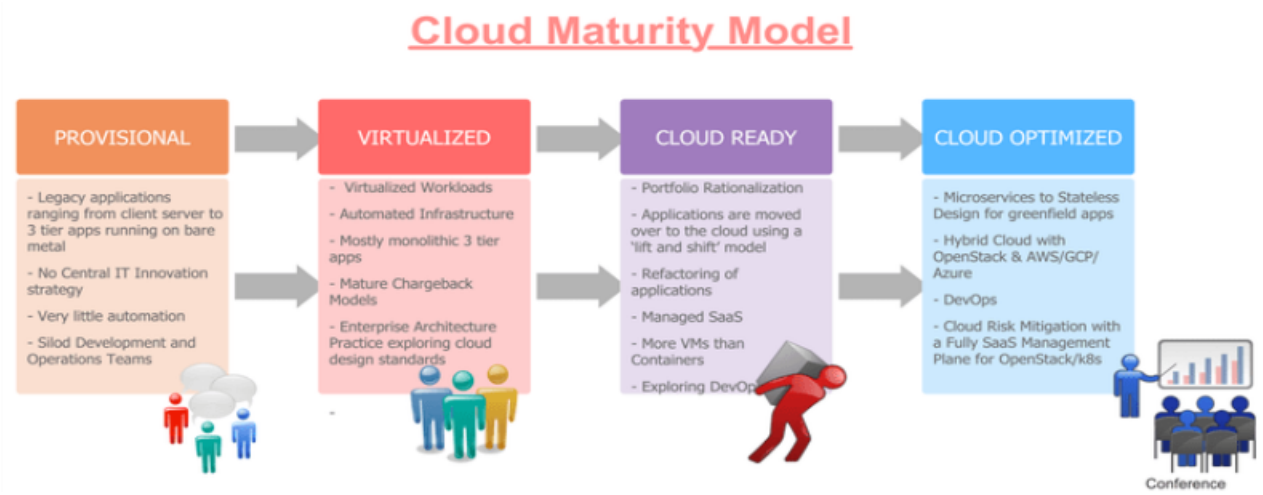
As compliance and security considerations have ameliorated, enterprises have begun moving workloads into the public cloud in addition to building feature-rich private clouds. The combination of both – thehybrid cloud – will become the dominant infrastructure model in 2018 and beyond. In this blog post, I propose an enterprise maturity model applicable to firms either looking at cloud computing as a way of saving costs or creating new business models leveraging the inherent flexibility in the cloud-native paradigm.

Introduction

Enterprises have just begun embarking on a decade-long journey to move to a cloud technology-dominated IT landscape across both IT infrastructure and development. While the critical drivers for each enterprise may vary, the criteria such as the time to market, reduced cost, and easier manageability are usually deemed important.

A four-stage cloud maturity model is depicted in the figure shown below. At the first and second maturity stages, enterprises can be termed as starters who lag behind their technologically savviest competitors. At the remaining two levels, firms begin to view IT as enabling self-service, collaborating more with developers to build & incrementally enhance enterprise applications.



Stage #1: Provisional

At the first stage, Cloud Computing & its associate terms—IaaS, Containers, Orchestration, SaaS, etc., are terms that the organization is intimately familiar with.

- Most of the infrastructure is internally hosted with two or more data centers spread across a country or spanning one/two continents.
- The total application estate numbers in the hundreds. The organization also lacks central IT architecture standards and it is mostly a mishmash of applications.
- The process followed in developing these applications ranges from waterfall to different forms of agile but the monolithic architecture/three-tier architecture hinders flexibility in the applications themselves
- The hardware platforms are a mix of proprietary & open Unix variants (HP UX, Solaris, Linux etc) to Windows.
- Lines of business in these organizations are typically unhappy with the inflexibility of the underlying infrastructure & view IT as a bottleneck

- Thus, IT groups tend to be heavily siloed with influential lines of business making their own technology purchasing decisions.

Stage #2: Virtualized

For organizations in the second stage, server virtualization is heavily deployed across the board. While terms such as IaaS, Containers, Orchestration, SaaS etc are things being actively discussed across development, infrastructure and operations teams – the predominant model is running vendor-supplied software to manage large fleets of virtual instances – often hundreds of thousands.

- Most of the infrastructure is internally hosted with two or more data centers spread across a country or even span one/two continents.
- However, there is growing interest in lines of business using the public clouds due to their dissatisfaction in central IT providing them servers with long lead times (typically between 1 and 2 months)
- While the total application estate numbers in the hundreds, enterprises in this stage have begun setting down central IT architecture standards to reduce application sprawl.
- In a move to improve flexibility around monolithic architecture/three-tier architectures, these organizations begin adopting DevOps-type practices at specific points in the development lifecycle. These include unit testing, continuous integration & real-time application monitoring. The common goal is to reduce errors in applications and to reduce mean time to detecting failures in live applications serving customers.
- While silos are being broken down in IT, there is a bid to rationalize data & application assets, purchasing decisions are shared between lines of business and the IT group
- Shadow IT begins to show up more and more.
- However, the costs associated with proprietary virtualization have begun to constrain budgets. Lines of business are accelerating moves to Linux based virtualization running on commodity servers to stay cost-competitive. However, system administration skills and costs associated with migration remain a significant bottleneck.

Stage #3: Cloud Ready

At the Cloud Ready stage, the organization due to its leadership realizes that their target IT end state will be a cloud-based delivery of IT services – be those applications or servers or storage or application stacks for developers.

- The organization typically under the direction of a CIO undertakes a large portfolio rationalization exercise where applications are being

targeted for a move to a public or a private cloud – based on granular criteria.

- The move to a cloud is dictated by Quantitative factors – economics (such as infrastructure costs, developer/admin training/interoperability costs), Return on investment (ROI), the number of years/quarters passed before breakeven & Qualitative factors – the tolerance of the business for short-term pain, the need for the enterprise to catch up with and disarm competition etc. It may also very useful to combine this analysis with existing IT vendor investments (contracts and the like) across the full global infrastructure footprint so that a holistic picture of the risk/rewards continuum can be built. One also needs to take into account if the combined planned cloud spending can somehow be incorporated into existing legacy modernization/re-platforming projects or data center consolidation projects.
- Other criteria which dictate these moves vary from needed levels of regulation, and performance. Typically enterprise applications will continue to live on-premises.
- Greenfield applications that can benefit from a cloud-based development and delivery model based on business requirements will move to a mix of the private and the public cloud. These applications are being developed using a DevOps process. This includes CI/CD pipelines and monitoring – services easily available on public clouds.
- At this stage, teams complaining about the high cost of proprietary virtualization & those with highly regulated greenfield applications will tend towards POCs on a private cloud – typically an IaaS solution like OpenStack running KVM as a hypervisor.
- As a result of the portfolio analysis, a vast majority of monolithic applications are being targeted for an initial lift and shift, which means that they are going to be ported over to the cloud running on VMs.
- Re-platforming code remains an ideal if an elusive option due to cost considerations.

Stage #4: Cloud Optimized

At the Cloud Ready stage, the organization due to its leadership realizes that their target IT end state will be a cloud-based delivery of IT services – be those applications or servers or storage or application stacks for developers.

- Given rapidly maturing cloud-based delivery models (IaaS and SaaS) – enterprises in this stage compulsorily include an awareness of cloud-native architecture strategies and design across these four key technical domains.
- Cloud native ways of developing applications become the de facto

standard. Cloud native applications need to be architected, designed, developed, packaged, delivered, and managed based on a deep understanding of the frameworks of cloud computing. The applications themselves need to be designed for scalability, resiliency, and incremental enhancement from the get-go.

- Depending on the application, supporting tenets include IaaS deployment & management, and Container Orchestration. These applications need to support the development of & incremental enhancements using agile principles. The fundamental truth is that not only will this change how your infrastructure is provisioned & deployed but also how it is managed.
- Cloud Architecture in this stage spans four critical areas: 1) Business Architecture, 2) Data Architecture, 3) Application Design, and 4) Deployment Architecture.
- Firms at this stage will deploy CaaS (Containers as a Service) and FaaS (Functions as a Service) extensively. The lack of composability of a PaaS will drive the housewide adoption of technologies such as Kubernetes in its open source form.
- Firms realize that operational costs are far and away the biggest when running a private cloud, not hardware or power or cooling. This will result in enterprises shifting workloads back from public clouds to private clouds that have been optimized for low operational cost and complexity.

My Recommendations…

Whatever stage you are in at this point in time, you will be further along in months or years depending on the pressures in your business. With the easy availability of public cloud services, many larger enterprises have significant "shadow IT" expense in addition to the cost of supporting existing internal infrastructure. What then are some best practice recommendations that firms at any stage of cloud maturity can take value from? I posit that there are six key things.

1. Drive the business case with economics and business value realization models in mind. An inefficiently designed cloud landscape can actually be catastrophic for business in terms of both cost and operational challenges.
2. Consider a range of hybrid cloud architectures keeping the above maturity levels and architectures in mind. Avoid lock-in to IaaS providers or to cloud stacks as much as possible. As a way of de-risking, invest in a private cloud strategy. The public cloud will never be a panacea.
3. The biggest pain point in running a private cloud is typically in OpEx

maintenance costs. Consider adoption of a SaaS Managed solution that deploys, monitors, troubleshoots and seamlessly updates your private cloud, so you can rest assured you've got the most advanced private cloud management at the lowest possible operational cost, for years to come.

4. Multi-cloud management is a challenge cloud admins will need to deal with and something management needs to account for in the entire business case – economics, value realization, headcount planning, chargeback etc. The 'single pane of management' is a worthy goal to aspire to. However, beware of vendors selling 'integrated' stacks. These are as much a lock-in as are the public cloud APIs.

5. Leveraging successful blueprints and patterns around vertical industry adoption. How are leaders in your industry using the cloud for specific use cases common to everyone operating in the vertical?

6. Investments in SaaS-based management planes across three important dimensions – private, public cloud and container native development – are key. These will serve as a way of de-risking your hybrid cloud and container management investments.