



kahu
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CLOUD ECONOMICS 101

**Are You Leaving
Cloud Money
on the Table?**

Cloud computing has taken the IT landscape by storm as infrastructure managers trip over each other to move their workloads into the cloud. The number of deployment options for CTOs and CIOs alike are absolutely dizzying, including hybrid and private cloud architectures. These options continue to drive demand for lower costs and greater flexibility, some of the reasons why Information Week positioned cloud computing as the top CIO priority in the coming years.

But don't think that you can get by without doing your due diligence; simply throwing your workloads into the cloud could have devastating consequences for your bottom line. That said, It's imperative that you understand your company's data and workload demands before choosing a cloud solution. Usage patterns and workload characteristics will be key variables in guiding your decision for selecting the right cloud platform for you.

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Crush Your Costs

STEADY-STATE CAPACITY AND USAGE PATTERNS

Perhaps the most important component you will need to identify is what your minimum capacity for operations will be. This is referred to as your “steady-state capacity,” and it is defined by the minimum capacity needed to keep the operational lights on. It is the capacity you need to run your workloads all the time, regardless of the calendar day or current season.

For example, a SaaS business that sells licenses to a healthcare management platform might never dip below the required capacity of 18 TB of storage and 36 virtual cores. This would be their steady-state capacity. There might be slight hikes in traffic or storage utilization depending on the week—their usage patterns—but overall their “baseline” is served by this minimum resource allocation. Over time, an organization can start to predict these times of peak traffic to determine their usage patterns.

These two factors, steady-state capacity and usage patterns, are integral to the understanding of where your business falls in the hierarchy of workloads and what type of cloud solution is right for you.

TYPES OF WORKLOADS— WHERE DOES YOUR BUSINESS FIT?

Businesses come in all shapes and sizes, and each one will have decidedly different cloud capacity requirements than the next. We can, however, segment businesses and their workloads by looking at which phase they are in to determine an optimal platform.

Small Workload with Unestablished Usage Patterns (less than 8 cores of CPU, 1 TB of storage, and 1TB of aggregate bandwidth per month)

Startups often have small computing and storage workloads when they start. They're typically characterized by unpredictable traffic and system load since the business concept itself is being market tested. Markets and business execution often determine how much usage applications will get. Therefore, public clouds are often good environments for startups since infrastructure can be resized and expanded very rapidly.

Since the infrastructure footprint for startups is typically small, it does not make sense to commit to single-tenant or dedicated infrastructure at this phase. It makes more sense to use small virtual machines, metered storage, and metered bandwidth to keep costs at a minimum.

Moderate Workloads with Highly Variable Usage (more than 24 virtual cores, 2 TB of storage, and 3 TB aggregate bandwidth per month)

Young businesses that are either revenue positive or profitable typically have an established baseline for compute, storage, and network utilization. But some are completely variable.

An example would be a software business that models trading strategies for high frequency traders. Their models are complex, and their computing requirements for backtesting are highly variable—they could need 2 virtual CPUs and 1TB of storage one day, and 100 virtual CPUs and 50 TB the next day. They could go with no requirement at all for several days. Here there would be no minimum baseline on any given day, but there could be an average.

If your business looks like this, you want to compute the monthly average for your cloud costs over a 6-12 month period. If your monthly cloud rent is more than \$15,000, you have a moderate workload despite minimum steady-stage capacity being completely variable.

There are a few options for this type of workload. For one, you can purchase a dedicated cloud infrastructure and stop paying rent forever. In this model, you would buy the infrastructure footprint to handle the average. In a financed model on a 24-month term, at month 25 the core cost of the cloud would drop out, and monthly costs would be somewhere around \$3,000/month (an 80% cost reduction). Any workloads requiring more than the dedicated footprint would be bursted onto public cloud infrastructure.

Your second option is to rent forever on a public cloud. The upside is there is less capacity planning up front since the public cloud is entirely elastic and shared. The downside is you will be paying significantly more, and individual virtual machine performance will be less than a dedicated cloud since it is a shared environment.

Moderate Workloads with Established Usage (more than 24 virtual cores, 2 TB of storage, and 3 TB aggregate bandwidth per month)

Another type of workload is an established pattern with predictable spikes of usage. An example would be an e-commerce store that sells mattresses. They might require an average of 36 virtual CPU and 4 TB of storage for 6 months out of the year, but on Christmas and Black Friday they require 80 virtual CPU and 30 TB of storage to accommodate the surge of transactions. In this case, they have a defined steady-state capacity.

They may experience traffic bursts across their platform depending on usage patterns unique to their business but overall growth tends to be linear for a modestly growing business.

If your business looks like this, you want to stop paying rent on your steady-state capacity. You can buy a dedicated cloud for your steady-state capacity and burst seasonal traffic onto the public cloud. This is the most cost-effective approach, even if it requires a little capacity planning. The alternative is to rent forever on a public cloud. This requires less capacity planning but will end up costing the business significantly more money in the long run.

Heavy Workloads with Highly Variable Usage (more than 50 virtual cores, 10 TB of storage, and 4 TB aggregate bandwidth per month)

In some cases, businesses may have very significant compute and storage requirements, but have wildly variable usage patterns. An example might be an advertising network that is constantly shrinking and expanding its cloud footprint to accommodate variable advertising click-through across its platform. They may have a minimum of 50 virtual cores and 10 TB of storage, but could scale up to as many as 400 virtual cores and 100 TB of storage, regardless of seasonality.

In this case, the business needs to juxtapose the cost of capacity planning overhead needed on a private cloud against on-going rent on a public one. On a public cloud, this business would rarely have to capacity plan and would simply consume/release resources as necessary. However, it would be exceedingly expensive to pay for this much infrastructure on a rental basis forever.

On the other hand, a private cloud solution would drive the majority of their cloud costs out of their platform. However, it would require a reasonable amount of capacity planning to nail down the appropriate steady-state capacity.

Heavy Workloads with Established Usage (more than 50 virtual cores, 10 TB of storage, and 4 TB aggregate bandwidth per month)

Heavy workloads, whether they require a significant amount of CPU capacity or a ton of storage, are generally associated with established businesses and enterprises. There are many businesses that do less than \$6M/year that still have very significant compute and storage capacity requirements. Unfortunately, public clouds tend not to be the best solution for these environments if they have an established workload.

Since heavy workloads are inherently in need of many CPU cores and storage volumes, running them on public clouds at retail prices tends to be expensive. Add high availability for underlying storage to this mix and your costs double, especially for storage like EBS on AWS. In this case, it makes no financial sense to be in a public cloud.

ADDITIONAL CONSIDERATIONS FACING A CLOUD PLATFORM DECISION

Migrating your business to the cloud has undeniable benefits and should be a top priority for any executive in today's digital landscape. Your efforts will improve organizational profitability and increase overall operational power. But, before you go there, there are some considerations you should be aware of.

Performance

A cloud environment undoubtedly has many benefits: it provides on-demand computing and storage, the environment is incredibly elastic, and it allows for smooth curve scalability. However, a public cloud space is shared across many users and is often oversubscribed. This can bog down the system and decrease your overall performance on daily operations.

If you're running a public cloud instance, you will need to be cognizant of establishing expected latency so you can define your baseline needs. You will also need to overcompensate your infrastructure to counteract performance drops from disruptions from noisy neighbors, stolen CPU cycles, and I/O oversubscription. Dedicated cloud environments are typically less noisy and more stable, so performance issues are less of an issue in these scenarios.

Security

“Security issues” has long since been a phrase associated with storing information on the cloud. In fact, Gartner named security and regulatory compliance as among the biggest barriers to making the conversion to a cloud model.

Public clouds are especially difficult to secure. You have little to no control over your neighbors’ attack surface, and it’s hard to mitigate attacks without blowing out your overall cost. A private cloud environment lives in-house, and is therefore a lot more difficult to breach, but is more complicated to maintain. It is for these reasons that many enterprises rely on managed cloud providers to maintain and implement security best practices on their behalf.

Administration

Cloud computing cannot administer itself. When considering the cloud, you need to be honest with yourself. Is your team ready to support an infrastructure on a 24x7x365 basis? Do you have resident experts in caching, database optimization, and storage scalability? What about folks that can optimize for performance while keeping your cloud costs to a minimum?

Some companies find administrative solace in hiring an outside team to manage the daily happenings of the cloud structure. This frees them up to focus on their core competencies, which often increases their bottom line and opens up a wider profit margin as a result.



CHOOSING A PROVIDER AND MODALITY

At the end of the day, your cloud model decision is going to come down to the restrictions and requirements of your business. What is the price point or budget you are working with? How much and when are you expecting to grow? What does your workload and usage pattern look like? It is critical to identify your specific needs before making any decisions.

We understand that without experience or expertise in this field, navigating all of these factors can be overwhelming. But the benefits of cloud computing are more than a nice perk for a business—they are a crucial adaptation that every business needs to implement in order to stay competitive in the market. That's why we are here to help.



CRUSH YOUR COSTS

Crush your IT budget with the Kahu compute fabric and improve the quality of your software products by rethinking your computing infrastructure. Kahu can **save customers upwards of 64% over traditional cloud and virtualization solutions** by eliminating traditional three-tier architectures and simplifying your technology stack.



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your enterprise datacenter to the next level with
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