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WHITE PAPER

The Definitive IT Sourcing Guide to Cloud Vendor Competitiveness, Pricing and Support

PART I: VENDOR COMPETITIVENESS

*Featuring comparisons among Amazon Web Services,
Microsoft, Google, IBM and Oracle*

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About This Series

The cloud may be pervasive, but doing business with cloud vendors (particularly IaaS/PaaS) is still immature in many ways. What are each vendor's strengths and weaknesses? What pricing nuances should be considered? And how does support compare?

From an IT Sourcing perspective, this three-part white paper series explores what really sets five IaaS/PaaS vendors apart in the following three areas:

Part I: Competitiveness

Part II: Pricing

Part III: Support

A Pragmatic Review of Cloud Vendor Strengths and Weaknesses

CLOUD REALITIES

We've all read the stories about the cloud market growing by leaps and bounds. Businesses are adopting cloud services at an accelerating rate, and provider profits are rising. This white paper series focuses on the public Infrastructure as a Service (IaaS)/Platform as a Service (PaaS) space, where the names most commonly mentioned by enterprise buyers are Amazon Web Services, Microsoft, Google, IBM and Oracle.

The undisputed leader of the pack has been AWS, which has produced a cash-generating engine for Amazon that feeds investment in other business segments. Most recent estimates from global technology market analyst firm Canalis indicate AWS currently owns 31.7% of the cloud infrastructure market. Microsoft takes the number two spot for market share. While the company reports growth in Azure revenue at 90+% year-on-year, market share for Microsoft is still in the 16% range.

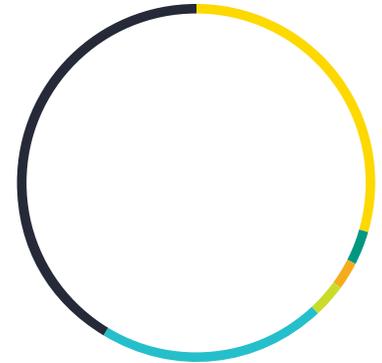
The AWS vs. Microsoft cloud wars will continue to heat up and should be watched closely. The recent availability of Azure Reserved Instances will only help grow revenues and adoption for Microsoft. And, while Amazon is still the 800-lb. gorilla in the market, Microsoft has considerable resources to invest in closing the market share gap.

A few other observations: Google is also a standout performer as it relates to growth. While market share hovers around 7%, it has experienced 100% year-over-year growth in that area. Together with Microsoft and AWS, the three vendors are expected to capture 80% of all cloud revenue by 2020 (according to Forrester). IBM and Oracle's market share in the space are also nominal – but both vendors are experiencing growth in their public cloud offerings.

While market share and revenues are one way to gauge vendor competitiveness, another way is to measure the percentage of application workloads deployed. In a report published by the Cloud Security Alliance, the CSA estimates that AWS's popular public cloud infrastructure platform runs 41.5% of application workloads in the public cloud, and Microsoft Azure is gaining at 29.4%. Google and IBM SoftLayer are the next tranche of contenders, while Oracle most likely falls into the "Other" category.

IaaS Platform Adoption

PERCENT OF APPLICATIONS DEPLOYED



SOURCE: CSA

- 41.5% Amazon Web Services
- 29.4% Microsoft Azure
- 2.9% Rackspace
- 2.6% IBM SoftLayer
- 3.0% Google Cloud Platform
- 20.7% Other

Cloud Computing Service Categories

SaaS – Software as a Service

A software distribution model in which a third-party provider hosts applications and makes them available to customers over the internet.

EXAMPLES: Salesforce, NetSuite, Concur

PaaS – Platform as a Service

A model in which a third-party provider hosts application development platforms and tools on its own infrastructure and makes them available to customers over the internet.

EXAMPLES: AWS Elastic Beanstalk, Google App Engine, Heroku

IaaS – Infrastructure as a Service

A model in which a third-party provider hosts servers, storage and other virtualized compute resources and makes them available to customers over the internet.

EXAMPLES: AWS, Microsoft Azure, Google Compute Engine

So, how do these numbers translate to actual adoption among enterprises? This is where a reality check is sorely needed as IT leaders seek a true picture of peer activity in the cloud. Market research figures on cloud adoption are notoriously inconsistent and unreliable – and much of that is due to the fact that “cloud” has come to mean many different things depending on the audience and the context. Virtually every company uses SaaS or cloud-based software of some sort (e.g. marketing, project management, etc.), which at a literal level means nearly 100% of companies are “using cloud” today. Even answering “yes” to a survey question about using IaaS could mean a company is simply using a few free servers someone set up in a business unit just to see what all of the buzz is about.

For the purposes of this white paper series, and this part on Cloud Vendor Competitiveness, we seek to explore the IT sourcing implications of substantive IaaS/PaaS deployments only.

THE PLAYERS – STRENGTHS AND WEAKNESSES

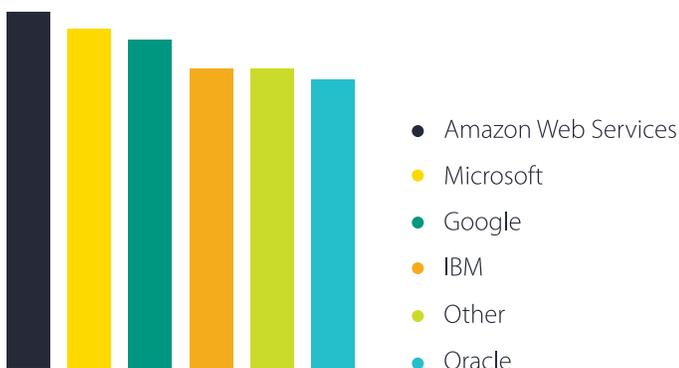
As indicated in the previous chart, the market share leaders are Amazon’s AWS, Microsoft Azure, Google Compute Platform and IBM Cloud (the SoftLayer branding is being phased out). These providers, plus Oracle, are the ones that NPI is asked about most frequently by our enterprise clients.

Amazon Web Services

Amazon was the first player in the public IaaS space and leads the market. It’s notable for aggressive product and service development, strong marketing and a willingness to jettison existing norms to create something new, even when it means inventing its own technology from the ground up to make it happen. Unlike Google, AWS realized early on that growing its presence in large enterprises would require making it exceptionally easy to purchase, in order to be effective against competitors like Microsoft that already had strong enterprise relationships. This was a plus for enterprise procurement. AWS’s other portals into large accounts include business units frustrated with IT roadblocks and development teams interested in using the newest, most exciting or most fashionable tools.

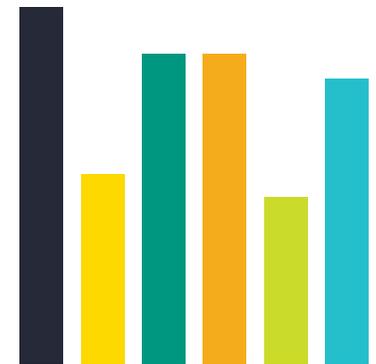
Not long ago, AWS was the only major provider with Reserved Instances, essentially just VMs hosted under the old flat rate per month model. Reserved Instances make sense when the customer needs guaranteed capacity all of the time at a fixed cost – as compared to the cost variability with on-demand or “pay-as-you-go” pricing. IBM SoftLayer came out with “monthly pricing” a bit later, and both Microsoft and Google responded with 1-year and 3-year Reserved Instances of their own.

According to a survey of more than 624 IT and Sourcing professionals, respondents reported IaaS/PaaS usage by vendor ranked by most to least annual spend as:



SOURCE: NPI CLIENT SURVEY, APRIL 2018

Interested in knowing which services your peers are using in the cloud?



SOURCE: NPI CLIENT SURVEY, APRIL 2018

- 100% Compute
- 53.33% Network
- 86.67% Storage
- 86.67% Database
- 46.67% Middleware/Integration
- 80% Analytics/BI

AWS STRENGTHS

Market Share	Number 1. AWS enjoys the benefits of first-mover advantage, and consistently sets the pace and direction for the cloud space.
Innovation	AWS invented this space. It continues to listen to customers and invent new services at a breakneck pace.
Open Source	At heart, AWS is still a retailer. It knows that competitive cost drives higher sales, and if the total solution is cheaper because open source products are included, it's more likely to win the deal.
3rd Party Support	Broad third-party support. Every major OEM/ISV now hooks into AWS, from storage to network to virtualization.
Per-Minute Pricing: Basic Linux	AWS's "per-second" pricing has a one-minute minimum, so to avoid confusion we're just calling it "per-minute" as it's not really much more granular than Azure or Google's per-minute pricing. It went into effect for EC2, EBS storage and a few other services on October 2, 2017. For storage, the effect is negligible unless your app is constantly writing and deleting data so that your consumption can decrease significantly from one moment to the next. The bigger impact is for EC2-based applications where workloads fluctuate and VMs are continuously added and released. Keep in mind, however, that it is only available for instances running a basic Linux OS – no Red Hat and no Windows.
Breadth of Services	The AWS catalog is enormous, with support for numerous security standards and services focused on specific verticals such as government and healthcare.
Spot Market	You can get access to resources at reduced cost by purchasing them on a "market" from other AWS customers. Spot market is also where AWS sells excess unused capacity, and is an excellent option for transient, time-intensive workloads (such as encoding jobs or Hadoop cluster worker nodes).
Glacier	Super-cheap storage suitable for archival of data where very long restore times are acceptable (involves manually retrieving the drive and plugging it in).

AWS WEAKNESSES

Biggest Target	The market leader is always in the crosshairs. This is true for hackers as well as competitors.
Windows	AWS will sell you Windows-based cloud services, but it has little control over the cost of the OS. Obviously, Microsoft knows the platform better and can offer a compelling case for superior support. Since Microsoft is a major competitor, AWS clearly wants you to use Linux, and some AWS services will only work with Linux.
Hourly Pricing – Windows and Red Hat	Much AWS pricing for compute and storage is still by the hour, including anything running on Windows or Red Hat Linux, which means you pay for a full hour even if you only use a few minutes in that hour.
Discount Limitations	Volume discounts only apply to reserved instances, and any price drops that happen during your reservation period are not passed on to you unless you use Convertible Reserved Instances and convert them to get the new price. Convertible RIs cost a little more than Standard RIs but also allow you to change the instance family or OS, which is an innovative feature. Substantial discounts require a substantial, multi-year commit and require customers to cover any shortfall in their usage.

Microsoft

Microsoft took some time to adapt to the threat posed by AWS when cloud first hit the market, but to the vendor's credit it has embarked on a path of innovation in the cloud space that distinguishes it from the way other industry behemoths have historically adapted to disruptive market changes. Microsoft has responded directly to new offerings or new pricing from AWS (e.g., Lambda and Azure Functions) instead of simply downplaying them, and it's shown an ability to take leadership where it makes sense for its customers (e.g., Azure Pack, ExpressRoute, PaaS).

While AWS may have opened the door to the idea of a non-IT company running your data center, Microsoft moved quickly to leverage its existing relationships with the development community and with enterprise IT for software and consulting. Its relationship with developers has been particularly valuable, as developers have been the key early decision-makers regarding which platform their new cloud applications would run on. Discounts for existing customers are very compelling right now. Once you've made the transition, however, your discounts will decrease along with your leverage, so today's aggressive deal-making by Microsoft won't likely characterize your long-term relationship.

MICROSOFT STRENGTHS

Market Share	Number 2, a position where Microsoft flourishes as an excellent fast-follower. Once a space has been defined and the business model is validated, Microsoft knows how to focus engineering and financial resources to further commoditize the services and use scale, reach and partners to drive widespread adoption. Popularity is mainly in large enterprises and Microsoft development shops. Customers that don't like to sole-source critical services will often use both AWS and Azure to diversify risk.
Windows Platform	Still a leading platform in the enterprise, Microsoft has more leverage over the technology, the pricing and the installed base.
Enterprise Presence	Microsoft's enterprise relationships are far older and deeper than AWS's. The IT department is more comfortable dealing with a provider that they know.
PaaS	Platform as a Service is a natural for Microsoft given its heritage as a development tools vendor. Though PaaS is certainly available on AWS, Azure is usually considered more robust by shops that already know and like Microsoft tools such as .NET. Azure actually began life as a PaaS service in 2010, with IaaS added later.
Azure Stack	At heart, Microsoft is still a software company. If you'd rather host your own private cloud in your data center, but you want to use technology that's a subset of your public cloud provider's, thus easing the burden of training staff and coding hybrid solutions, Azure Stack will look pretty good to you. It's also a win for companies like defense contractors that have a "thou shalt not use external infrastructure" imperative. As long as it can sell you software, Microsoft is happy.
Per-Minute Pricing	Microsoft doesn't like being number 2, and that means the vendor is willing to innovate on pricing to gain market share. Per-minute pricing is one way it does this and, for instances with intermittent workloads dispersed over time (running one minute, idling the next), that can make a very noticeable difference in your monthly bill. Microsoft's pricing has the same granularity as GCP or AWS-Linux, and it's the only vendor that rounds down to the nearest minute instead of charging you for additional seconds, so those extra seconds are free.
Discounts	If you're a Microsoft customer, there are ways to leverage your existing licensing to pay less for Azure, which is already priced competitively with AWS (prepayment, AWS price matching for ELA customers, Windows CIS licensee discounts, Software Assurance customer license credits). Microsoft essentially looks at your move to Azure as an upgrade if you're already a Windows Server customer, so you pay a lower upgrade-style price instead of full fare – but the details can be complex. Microsoft appears to be temporarily giving up some revenue on Windows Server in order to move its customers to Azure, so shops with large number of Windows Server licenses should make sure to use these discounts while they last.
Basic and Low-Priority Instances	"Basic" instances cost less, but don't work with all functions, such as Azure Load Balancer, so this is used more for dev/test project phases. "Low-priority" indicates cut-rate compute instances that only run when they're available, targeted primarily at batch computing. This is great for workloads that just need to run, but not on a fixed schedule, and was likely developed in response to Google's preemptible instances.

MICROSOFT WEAKNESSES

Linux	Obviously, Microsoft would rather you use Windows. Its Linux support is there because it's a market imperative. Azure customers that use it typically have Windows instances as well.
Block Storage Pricing	Microsoft adds a charge of \$0.0005 per 100,000 transactions on top of the monthly fee, which AWS does not.
Perception of Innovation	In some ways, having an installed base can be a disadvantage. Though Microsoft has been good at bringing out innovations focused on that base, it's also followed AWS's lead on things like Reserved Instances and Function-as-a-Service ("serverless") that get a lot of press for being game-changing offerings. Microsoft has also earned a reputation for needing multiple iterations before getting something right and for releasing capabilities not yet ready for "primetime" in the enterprise. In the age of cloud, the vendor has done little to shed that reputation. Both Azure Pack/Stack and Azure Functions, for example, were announced years before they were actually available to buy. Reserved Instances were touted on the website long before actually being available for purchase.

Google

Google's entry into the cloud space was all about capitalizing on disruption and expanding its attack on Microsoft's markets – an attack that began earlier with phones, web browsers, applications and all things internet. In this competition, however, Google finds itself in the unenviable position of neither having invented the service model nor having a significant presence in, or relationships with, enterprise IT. What it does have, however, is a stellar reputation for being a company that can invent technology good enough to disrupt markets and even entire industries (e.g., automotive).

At the advent of IaaS, Google had already started an internet-based application strategy, and cloud provided an air of acceptability to those products just as it did for the entire SaaS (formerly ASP) market. As the coolest kids on the block, Google's market successes for cloud tend to come from start-ups anxious to use cutting-edge tech, recent graduates, and individuals or teams in organizations that know Microsoft but would rather not pay for application software. Google is also leveraging its success in Big Data and Intelligent Automation to establish a reputation as the leader in cloud services for AI.

GOOGLE STRENGTHS

Perception of Innovation	Google has a "we can do anything" mystique rivaled only by Elon Musk's holdings right now (though Jeff Bezos is working on it). In some circles, particularly in Silicon Valley, Microsoft is looked at as older generation tech by comparison.
Artificial Intelligence & Data Analytics	At heart, Google is both a data-driven marketing company and a technology company, and the latter is often an enabler of the former. Its aim tends not to be to sell software licenses as much as it is to give the world access to technology in a way that will let Google learn about you, and then it owns the information about your interests. If you're looking at Google's browser, its applications or its development tools, those are all wins because Google has your eyeballs every minute that you're engaged, and you're paying rent for the privilege, either in the form of subscription fees or looking at ads. From that perspective, cloud services are a natural fit for this company, and it makes sense that it started with applications rather than infrastructure. AI found its first killer app with marketing, and Google was right there with cloud-based services and leading technologies to make it happen. Early efforts like MapReduce and self-driving car technology (now spun off as Waymo) have diffused into the marketplace as Google has pushed forward to find newer applications for even more advanced AI.
PaaS	If you like Google development tools and the open source model, all of Google's platforms are going to be very attractive.
Per-Minute Pricing	Google tends to innovate on both technology and pricing to gain market share. The vendor pioneered per-minute pricing for cloud, and it can make a noticeable difference in your monthly bill, but it initially came with a 10-minute minimum. Then, when AWS released so-called "per-second" pricing with a 1-minute minimum, Google did the same. In actuality, the granularity of both services is similar to Microsoft's as all have 1-minute minimums.

Auto-Scaling	At time of research, GCP allows you to resize a VM by simply changing its machine type, though the instance must be shut down first, and you can even do it for instances with 1- or 3-year commitments. The other services can accomplish this but require reprovisioning the VM, and if you have standard AWS reserved instances you can only do it within the same instance "family." That means that vertical scaling (making your VM bigger or smaller as opposed to just adding more of them) should be much more practical with GCP.
Custom Machine Types	Though AWS has more pre-defined configurations, GCP lets you configure one of your own if you don't see a standard one that fits within limits. That saves you money by letting you avoid over-configuration.
Preemptible Instances	These are cut-rate compute instances that only run when they're available. They're great for workloads that just need to run, but not on a fixed schedule. They're also similar to Azure's Low Priority instances but have been around a bit longer.

GOOGLE WEAKNESSES

Windows	Like AWS, Microsoft is a competitor and is assumed to offer superior support for its own platform. Google customers are more likely to use Linux.
Enterprise Presence	Google's contacts in the enterprise tend to be in Marketing rather than IT. The typical enterprise IT or Sourcing department doesn't have experience buying from Google, or depending on it for mission-critical IT requirements.
Legacy System Integration	GCP has very little functionality to help customers integrate with on-premise applications or lift-and-shift existing apps to the platform. Its focus has been on cloud-native application development with Google tools such as Kubernetes.

IBM

IBM has arguably been the biggest loser in the cloud market share race. Of the providers profiled here, it is far and away the most experienced both in operating data centers and in providing infrastructure services to enterprise customers. The vendor is a laggard in market share, and some of the growth in public IaaS is coming at the expense of IBM's existing business. This has happened for four primary reasons:

IBM is seen as "old world," pre-cloud IT, clinging to antiquated service models and mature revenue streams just waiting to be cannibalized.

IBM has had to acquire its way into the newer cloud market and has had false starts that have left customers with the idea that IBM has little real expertise when it comes to cloud.

Many of IBM's global services customers aren't particularly happy with the prices they're paying. They've felt for a long time that they are probably paying too much, and there are growing ranks of consulting experts who can prove that through benchmark analysis and through quantifying TCO (total cost of ownership) for replacement solutions from other suppliers

In the early days of cloud, IBM wrongly assumed that IT infrastructure groups would be the primary decision-makers on what cloud services to use.

More often than not, that turned out to be wrong. The IT department was resisting cloud due to security and other concerns while development teams, particularly those run by business units, were circumventing IT all together and piloting their new applications with AWS or Azure. The large outsourcers like Accenture put together their own cloud offerings but were all too happy to put customer apps on AWS or Azure. IBM gave them no reason to steer the business their way.

Where Amazon and Google can encourage customers to move everything out of their private data centers, that's more challenging for IBM.

Those data centers generate a lot of revenue for IBM. Successfully developing and executing a strategy to migrate that spend to IBM's cloud is difficult and costly during the transition period. But of course that's the challenge that the legacy enterprise vendors are facing at all layers of the stack.

All that having been said, IBM still has the resources to offer customers a lot of choices, from IaaS to PaaS to SaaS, and some of its tools have been met with superior reviews. These tend to be premium offerings, but IBM is possibly the hungriest of the top providers and willing to make a deal on cloud infrastructure that it can reference during its next earnings call. In pursuit of greater market success, IBM has been continually reinventing its IBM Cloud offerings (formerly known as BlueMix) and has made notable acquisitions to beef up its strength in the cloud, including the acquisition of SoftLayer in 2013.

IBM STRENGTHS

Infrastructure Experience and Depth	No one has more data centers or more experience running them, though it's important to note that all services may not be offered from every data center. SoftLayer is an acquisition (now part of the IBM Cloud brand) and it's unclear how well those services have been integrated. It tends to be in discussions around requirements like security, availability and disaster recovery that customers value IBM's background the most.
Enterprise Presence	IBM has an existing presence within many enterprise customers. And for the ones that spend enough to get IBM's attention, that relationship may be strong and/or improving. Adding cloud to an existing IBM contract is an enormous opportunity to leverage the deal for better-than-standard pricing or SLAs, and IBM is always more willing to negotiate than the "big 3" cloud service providers.
Bare Metal	SoftLayer had most of its success renting servers with no OS on them at all, and IBM still highlights that option. Since this gives you complete control over the environment you have more flexibility to do what you want, such as implementing your own security policies. Lift-and-shift migrations should be more straightforward with bare metal servers. In some situations, this may be the only way to get what you need in a public cloud solution, and that can have appeal for traditional, control-oriented IT shops.
PaaS	IBM also has a robust, DevOps-friendly, open source-based PaaS solution in the form of the IBM Cloud Foundry.
Additional Services	If what you really want is a fully managed service, or consulting to go along with your cloud migration, that's IBM's bread and butter.

IBM WEAKNESSES

Cloud Automation	SoftLayer has a reputation for being less "cloud-like" and more similar to traditional web hosting than the other top three cloud providers – even though its services come with an extensive API. Scaling your infrastructure past the quota associated with your account will require interaction with sales. Unlike the "big 3," automated resiliency features are lacking and maintenance windows must be carefully planned for (VMs must be restarted after maintenance).
Perception of Innovation	IBM's acquisition and partnering strategy is reasonable (all things considered), and some alliances such as Cloud Foundry have been innovative. But the vendor's approach can leave customers with the impression that IBM isn't leading in the technology space. It's seen as a leader in AI with its Watson family of products, but that hasn't yet translated to a perception of innovation in cloud services.

Oracle

Oracle's value proposition is similar to Microsoft's in that the vendor is leveraging its existing market presence in software and consulting to build a cloud business. Just as Microsoft's most compelling proposition is for existing Microsoft customers, Oracle will appeal mainly to customers running Oracle databases, and that typically means large enterprises. It's a narrower focus than the vendor would have if it controlled the OS, and that difference is apparent from only a cursory look at Oracle's services and pricing. Configuration options are few but also have the horsepower to run Oracle products. Conceivably this could make the offerings attractive to customers that don't run Oracle but have applications with similar resource requirements. Oracle would need to bring extraordinarily effective marketing to bear to realize that opportunity, but that may be one card it holds in its favor – historically Oracle has been very strong (and outspoken) in sales and marketing.

ORACLE STRENGTHS

Oracle DBMS/ERP	Oracle has the most popular enterprise DBMS and one of the most popular ERP solutions. This leverage over the technology, the pricing and the installed base for those products should buy the vendor at least a look from many large customers. This includes availability of Oracle's Exadata machines in the cloud, optimized for Oracle DBMS processing.
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Enterprise Presence	Oracle is already embedded with its enterprise customers and the vendor is a famous negotiator. The vendor's need for high-profile wins means it should be at least as likely as IBM to make concessions to grow the business.
Large Configurations	Oracle is clearly focusing on large configurations that will run its software around the clock with options that large enterprises will find enticing, such as bare metal and dedicated servers.
Bare Metal	Oracle has a bare metal option, but it is for dedicated instances only (not shared with other customers, so carrying a higher price point).

IaaS/PaaS Expansion

The vast majority of survey respondents (86.7%) indicated they will expand their use of IaaS/PaaS in 2018. Of that number, 46.7% said they plan to expand usage substantially.

Source: NPI Client Survey, April 2018

ORACLE WEAKNESSES

Windows	No support for Windows Server 2016 yet, and Microsoft has all the mind-share here. Oracle's solution is more focused on Linux.
Limited Options	You won't find as many choices in terms of instance types, OS, DBMS, etc. as the others offer, at least not yet. Bare Metal is a workaround for now, since you can put whatever software you want on it.
SLAs	Oracle has numerous Service Level Objectives, but they are only objectives - none are backed up by financial incentives of any kind.
No Per-Minute Pricing	If you use an Oracle server instance for only a partial hour, you still pay for the whole thing, so Oracle is expensive for dispersed workloads.
Rough Edges	Some aspects of the service can feel unfinished. For example, Oracle's equivalent to Reserved Instances is its "Monthly Flex" purchasing option that requires a minimum 1-year commit, but the pricing calculator currently shows the same price for that as the Pay As You Go option. <i>Note: At the time this was written, Oracle Support Team confirms that the pricing number is incorrect. But since it can't provide the correct one, we weren't able to analyze that pricing. It's possible that Oracle has simply put the option on its web site before it is actually available, just as Microsoft did initially.</i>
Compliance	Being the new kid on the block, Oracle doesn't yet have the long and readily available list of standards compliances that the others do for IaaS. If you need PCI DSS, HIPAA, FedRAMP, etc., you'll want to ask Oracle about it directly.
Perception of Innovation	At heart, Oracle is a sales- and marketing-driven software company. It is perceived as a technology leader in market segments where it has crushed competition through highly effective sales and strategic acquisitions rather than by necessarily having the most impressive solutions. Like IBM, it's seen as "old world" IT and, like Microsoft, its announcements are often labeled "vaporware." Larry Ellison was notoriously skeptical of cloud when AWS pioneered the space, and his early remarks still haunt the vendor today.

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