

Top cloud IaaS providers compared



It has been about a year since I last updated the [comparison of cloud infrastructure-as-a-service providers](#). Over the course of this last year, we've seen even more changes to the market, from the pricing and plans to the market players to the services being offered. Some companies, such as Softlayer, have been acquired by others (IBM, in Softlayer's case), and yet more new entrants have appeared.

To account for these changes, and for other situations, I've made some changes to the comparison. First, IBM was dropped from the list, since the pricing information for its public cloud offering is no longer available online (they've shifted the focus onto Softlayer). Hosting.com also had to be dropped from the list since their pricing data is no longer online for anyone to access either.

The base instance for calculating the monthly price has also changed. This time around, I've used AWS's small instance (1.7GB RAM, 1 CPU) as a baseline to select instance types. The reason for this is that most providers not only compare themselves directly with Amazon, but also have started offering similar instance types. Another change is that I've opted to use the price values for servers running Windows. The reason for this is that the price is much more standardized for Windows instances than others, delivering better comparison results.

Finally, some dimensions were dropped. Storage costs were removed from the list since many of the providers don't really offer the ability for users to add or remove storage space from instances on the fly. The "support" dimension was also removed, since providers seem to have all standardized on a paid enterprise support model that is essentially the same for everyone.

The updated dimensions are as follows:

- **Cloud Promises**

- Cost reductions / optimizations (**Figure A**)
 - Variety of Pricing Plans –The more variety offered (hourly, monthly, etc.) the better a provider is considered.
 - Average Monthly Price - Estimated cost in US\$ for an instance as described above. When available, hourly pricing was used, based on 730-hour months. Otherwise, monthly pricing was used.
 - Cost of Outbound Data Transfer – The cost, in US\$, for each GB of outbound data sent from the server. Companies that offer a per second (Mbps) connection for free have costs listed as zero.
 - Cost of Inbound Data Transfer – Same as above, but for inbound data.
- Scalability and Automation (**Figure B**)
 - Scale Up – If it's possible to scale up your servers automatically, by adding more disk space, RAM or processing units.
 - Scale Out – If it's possible to quickly and easily deploy new images based on existing VMs.
 - APIs – If the company offers APIs to interact with the servers or not.
 - Monitoring – A 3-level subjective scale measuring the easy availability of monitoring tools:
 - Poor – Companies that have no monitoring/alert solutions integrated, requiring the deployment of third-party tools or that extra services be purchased
 - Average – Companies with very simple integrated monitoring tools (few indicators or no alerting)
 - Extensive – Companies with very complete integrated monitoring tools offered for no additional cost
- Choice and Flexibility (**Figure B**)
 - Number of Data Center Locations – The number of different data center locations where cloud servers can be hosted.
 - Number of Instance Types – The number of different available instance types, in terms of RAM, CPU, disks and so on.
 - Supported Operating Systems – The number of different supported operating systems (regardless of version) available as pre-configured

images.

- **User Concerns (Figure C)**

- Security Features

- Certifications – If the vendor has compliance- and security-related certifications, such as PCI or SAS 70.
 - Protection – If the vendor offers the possibility of protecting servers with firewalls and other security functionality. A 3-level subjective scale:
 - Poor – Companies that only offer the most basic security features (such as a basic firewall), or no features at all
 - Average – Companies that offer a more advanced mix of security features.
 - Extensive – Companies that offer not only several security features, but also some security automation.

- Ease of Migration

- Open Standards – If the vendor employs or supports open standards in cloud infrastructure.
 - VM Upload – If the vendor supports uploading your own machine images (made locally) to the cloud

- Reliability

- Service Age – How long the service has been around.
 - Service Level Agreement (SLA) – The uptime SLA offered (regardless of past performance), in percentage points.

We have 17 dimensions for 14 different providers. These dimensions are not complete, but they give us an interesting picture of the different providers. Below are snapshots of the main comparisons. I have provided the full data, including numeric and normalized data tabs in the [Excel spreadsheet linked here](#) (zip file) if you want to dig into it a little more.

Cloud Promises: Cost Reductions / Optimizations

Providers	Cost Reductions / Optimizations		
	Variety of Pricing Plans	Average Monthly Price	Cost of Data Transfer - out (/GB)
Top-of-Mind			
Amazon (EC2)	Pay-as-you-go, reserved, spot	\$ 66.43	\$ 0.120
Rackspace	Pay-as-you-go	\$ 116.80	\$ 0.120
GoGrid	Pay-as-you-go, month, semester, year	\$ 116.80	\$ 0.120
Microsoft	Pay-as-you-go, semester, year	\$ 65.70	\$ 0.155
Terremark	Pay-as-you-go	\$ 138.90	\$ 0.170
AT&T	Pay-as-you-go	\$ 121.30	\$ 0.100
Google	Pay-as-you-go	\$ 42.42	\$ 0.120
OpSource	Pay-as-you-go, monthly	\$ 95.63	\$ 0.150
Softlayer	Pay-as-you-go, monthly	\$ 182.50	\$ 0.100
HP	Pay-as-you-go	\$ 87.60	\$ 0.120
Upstarts			
BitRefinery	Monthly	\$ 69.90	\$ 0.050
Lunacloud	Pay-as-you-go	\$ 49.92	\$ 0.100
Nephoscale	Pay-as-you-go, membership	\$ 73.00	\$ 0.100
Tier3	Pay-as-you-go	\$ 109.50	??

Cloud Promises: Scalability and Automation / Choice and Flexibility

Providers	Cloud Promises						
	Scalability and Automation				Choice and Flexibility		
	Scale Up	Scale Out	APIs	Monitoring	Datacenters	Instance Types	Supported Operating Systems
Top-of-Mind							
Amazon (EC2)	Yes	Yes	Yes	Extensive	8	17	4
Rackspace	Yes	Yes	Yes	Extensive	9	7	4
GoGrid	Yes	Yes	Yes	Poor	5	7	7
Microsoft	Yes	Yes	Yes	Average	8	5	6
Terremark	Yes	Yes	Yes	Poor	10	32	6
AT&T	Yes	Yes	No	Poor	26	Configurable	2
Google	Yes	Yes	Yes	Poor	11	22	2
OpSource	Yes	Yes	Yes	Average	5	Configurable	4
Softlayer	Yes	Yes	Yes	Extensive	7	10	4
HP	Yes	Yes	Yes	Poor	3	6	4
Upstarts							
BitRefinery	Yes	Yes	No	Poor	4	Configurable	4
Lunacloud	Yes	Yes	Yes	Poor	5	Configurable	8
Nephoscale	No	Yes	Yes	Poor	1	13	4
Tier3	Yes	Yes	Yes	Poor	9	Configurable	9

User Concerns: Security / Migration / Reliability

	User Concerns					
	Security Features		Ease of Migration		Reliability	
	Certifications	Protection	Standards	VM Upload	Service Age	SLA
Providers						
Top-of-Mind						
Amazon (EC2)	Yes	Medium	Proprietary	Yes	5+ Years	99.95%
Rackspace	Yes	Medium	OpenStack	No	5+ Years	100.00%
GoGrid	No	Medium	Proprietary	No	5+ Years	100.00%
Microsoft	Yes	Medium	HyperV	Yes	1 - 2 Years	99.95%
Terremark	Yes	Medium	VMware	Yes	2 - 3 Years	100.00%
AT&T	Yes	Medium	VMware	Yes	4 - 5 Years	??
Google	Yes	Medium	Proprietary	No	1 - 2 Years	99.95%
OpSource	Yes	Medium	VMware	Yes	5+ Years	100.00%
Softlayer	Yes	Medium	OpenStack	No	5+ Years	100.00%
HP	No	Medium	OpenStack	No	1 - 2 Years	99.95%
Upstarts						
BitRefinery	Yes	Poor	VMWare	Yes	2 - 3 Years	100.00%
Lunacloud	No	Poor	Proprietary	No	1 - 2 Years	99.99%
Nephoscale	No	Poor	Proprietary	No	1 - 2 Years	99.95%
Tier3	Yes	Medium	VMWare	No	5+ Years	99.90%

Conclusions

It seems as if every time I do this comparison, the results improve. The information available about the different providers improves – their websites have improved, and so on. I believe this marks an evolution in the market, especially increased competition, which has led to better availability of information.

Once again, there is a wide variation in price ranges, from under US\$ 50 to over US\$ 180. There was, however, a widespread reduction in prices. This is evidence of two factors: the increased competition in this space, as well as economies of scale that large IaaS providers enjoy and that they can give back to their customers.

A couple more interesting trends are that most providers are now offering both “scale-up” and “scale-out” features, that is, the ability to dynamically increase storage, RAM and CPUs on a single server, as well as the ability to easily clone servers based on predetermined images. This is the natural evolution in this market, since this scalability is one of the greatest cloud promises. Following this trend is the way that

many providers are now allowing customers to build entirely customizable cloud servers in terms of resources, opposed to the fixed instance types that Amazon and Rackspace adopt.

Finally, I'm also seeing many providers basing their solutions on VMware technology and allowing customers to upload their own images to the cloud, which can be a very interesting possibility, especially for enterprise customers.

Once again, this comparison is far from authoritative, but it's meant to serve as a good starting point for anyone trying to easily see the similarities and differences between cloud providers. This can help both the newcomers to the cloud as well as people looking to change their current provider. It was based on information publicly available on the web site of the providers, so there might be variations contracts for specific customers.