



## Public cloud infrastructure comparison: IBM Cloud vs. Amazon AWS

Respondents to a recent survey indicated that their organization plans to migrate at least part of their infrastructure to the cloud if they haven't done so already.<sup>1</sup> Many vendors now compete in the cloud provider market to meet that demand, but their offerings can vary drastically. IBM offers IBM Cloud, an enterprise full-stack cloud platform providing public, private, and hybrid environments. Amazon has perhaps the greatest name recognition in the cloud provider market with its Amazon Web Services™ (AWS™) offerings. We explored the public cloud platforms of both and found several areas that companies looking for strong cloud performance may see advantages with IBM Cloud over AWS. This is purely a research report and reflects publicly available data.

IBM Cloud has more cloud-provided bare metal offerings with numerous configurations

IBM Cloud seems to offer better block storage read and write capability

IBM Cloud offers default fast data transfer technology for their object storage offerings

IBM Cloud allows management of multiple cloud environments regardless of provider

IBM Cloud offers free basic-tier tech support with 24/7 access

## Bare metal offerings

Most cloud providers offer a broad range of virtualized instances to meet the demands of many generalized workloads. However, there are still some cases where having dedicated access to a server's resources is crucial. Perhaps you may have applications with strict security or regulatory requirements that could be better satisfied with dedicated bare metal servers. For these and other specific use cases, the cloud may not seem to be a viable option. On the contrary, however, some cloud providers now offer bare metal solutions that give users dedicated access to an entire server.

AWS offers six rigidly defined bare metal configurations<sup>2,3</sup> IBM Cloud, by contrast, offers bare metal solutions with a wide range of highly configurable options to cater to any performance needs.<sup>4</sup> You can choose from single- to quad-socket servers, customize the amount of RAM, and choose from several drive types and sizes to get exactly what you need for your workload.<sup>5</sup>

With AWS, all six bare metal configurations aim to meet high-performance computing demands with large amounts of RAM, high core counts, and fast drives.<sup>6,7</sup> While many applications that would benefit from bare metal servers would probably also benefit from high-performance hardware configurations, that isn't always the case. Such high-performance configurations could be a waste of money and resources for companies that choose bare metal for security or compliance reasons.

### Flexible GPU options from IBM Cloud can help compute-intensive workloads

If you are searching for bare metal server solutions for gaming, deep learning, AI, machine learning, and other compute-intensive applications, then GPUs are probably going to factor into your considerations. AWS does not offer any bare metal solutions with GPUs.<sup>8</sup> IBM Cloud, however, offers bare metal servers with several different GPU options including NVIDIA Tesla P100 and V100 GPUs.<sup>9</sup> For applications requiring the additional compute performance of a GPU as well as the benefits of bare metal architecture, IBM Cloud may be the better option.

## Storage Considerations

### Object storage

All cloud providers offer object storage, but not all object storage is created equally. For companies that transfer a lot of data in and out of their cloud environments, there's more to consider than the capacity, cost, and security of the storage. The speed and ease of the data transfers are also important considerations. How long will users wait for data to transfer? Even relatively short periods of time can add up over days and weeks.

With IBM Cloud, organizations can benefit from native integration between IBM Cloud object storage and Aspera<sup>®</sup> high-speed data transfer. At no additional cost for traffic using the IBM high-speed network, and with no charge for transferring to the cloud, IBM Cloud object storage users can get transfer speeds faster than HTTP.<sup>10</sup> Unless you transfer extremely large amounts of data (up to several petabytes or even exabytes) the only data transfer acceleration options available from AWS Simple Storage Service (S3) are their S3 Transfer Acceleration and AWS DataSync.

Aspera data transfer relies on patented Fast and Secure Protocol (FASP<sup>®</sup>) transport technology to bypass traditional network bottlenecks,<sup>11</sup> while S3 Transfer Acceleration simply alters the path data takes. Instead of traveling relatively directly to the targeted S3 bucket over the internet, S3 Transfer Acceleration targets the closest Amazon CloudFront edge location, then routes the data through internal AWS networking to the S3 bucket. Although this may improve data transfer speeds, the data remains vulnerable to latency and packet loss. AWS also warns that using S3 Transfer Acceleration may incur additional data transfer charges.<sup>12</sup> For better speeds, a user can opt for

AWS DataSync. Unlike Aspera on IBM Cloud, AWS DataSync requires an on-premises appliance and charges for each gigabyte transferred.<sup>13</sup> For companies that need fast data transfers, IBM Cloud object storage with Aspera offers the more straightforward and cost-efficient option.

IBM Cloud and AWS both offer unlimited space within a bucket, but an IBM Cloud user can store objects up to twice the size of that allowed in AWS S3. The maximum size of an individual object in AWS S3 is 5 TB,<sup>14</sup> while individual objects in IBM Cloud can be up to 10 TB.<sup>15</sup>

By default, IBM Cloud secures data on all object storage environments with data-at-rest encryption.<sup>16</sup> For AWS, users must manually set at-rest encryption for each bucket.<sup>17</sup>

If your organization wants to try object storage technology before committing to it, IBM Cloud's free tier offers up to 25 GB of storage, 2,000 PUT requests, 20,000 GET requests, 10GB data retrieval, and 5 GB of public outbound bandwidth using Aspera high-speed transfer per month indefinitely.<sup>18</sup> AWS, however, offers only 5 GB of storage and 15 GB of data transfer out per month for one year.<sup>19</sup>

## Block storage

Like object storage, block storage is a default offering from cloud providers, but the details can vary greatly. With traditional drives and storage configurations, multiple applications and hosts can access the same device. With IBM Cloud block storage, you can continue this practice by attaching up to eight hosts to a single block storage volume.<sup>20</sup> Elastic Block Storage (EBS) from Amazon, though, has a policy of one host per volume.<sup>21</sup> An IBM Cloud website states organizations can get up to 48K input/output operations per second (IOPS) with any instance when they use the IBM Cloud Endurance or Performance tier block storage.<sup>22</sup> On AWS, your storage performance may vary depending on the instance you order. If your application requires more than 32K IOPS, you will need to choose the AWS performance-tier storage (io1) and provision their special Nitro-tier instances as well.<sup>23</sup> Amazon limits AWS EBS standard volumes (gp2) to 16K IOPS.<sup>24</sup>

## Management, monitoring, and tech support

Once you've built your cloud environment with various instances, storage options, and the like, the next step is to keep things running smoothly. The IBM Multicloud Manager helps you manage your Linux® Kubernetes® environments whether they live in the IBM Cloud, a private cloud, or other cloud providers. Your organization can deploy, automate, review, and set consistent security and governance policies across all your Kubernetes clusters.<sup>25</sup> Looking to avoid outages and down time across your IBM Cloud infrastructure? IBM Operations Analytics allows your organization to take advantage of IBM machine learning technology to collect, analyze, and use statistics from your environment as well as detect behavioral changes that could lead to a critical issue. IBM Operations Analytics also helps improve efficiency with automation and noise reduction.<sup>26</sup> AWS offers various management and monitoring tools, such as CloudWatch, but none appear to include AI-based predictive analytics or work with multiple cloud environments outside of AWS.

For those times when something does go wrong with your cloud, tech support is necessary to get your business back up and running. If a critical application goes offline, time is of the essence. IBM and AWS both offer three tiers of tech support, but there are important differences in the details.

All IBM Cloud users receive basic tier tech support, which provides 24/7 access, at no charge. AWS charges customers at least \$29 per month for their lowest tier, which offers only business-hours email support. For the mid-tier service levels, each provider offers four issue-severity options and a maximum wait time for each severity level.

According to IBM, customers will wait one to eight hours depending on the severity of their issue. According to Amazon, AWS users will wait one, four, 12, or even 24 hours for a response. At the highest level, IBM users must wait 15 minutes to four hours based on the severity of the issue.<sup>27</sup> AWS users pay \$5,000 (USD) more per month for the premium option and must wait up to 24 hours for AWS to resolve their issues.<sup>28</sup>

## Research summary

Cloud feature	IBM Cloud	AWS
Bare metal	<p>Hundreds of highly customizable bare metal configurations</p> <p>Bare metal options range from simple single-socket to high-performance quad-socket configurations</p> <p>Bare metal configurations with physical NVIDIA GPUs</p>	<p>Six rigidly defined bare metal configurations</p> <p>Only expensive, high-performance bare metal options</p> <p>No bare metal configurations with GPUs</p>
Object storage	<p>Aspera high-speed data transfer default with all object storage buckets</p> <p>Maximum object size is 10 TB</p> <p>Default data-at-rest encryption on all object storage buckets</p> <p>Up to 25 GB of storage for an unlimited time with free tier of object storage</p>	<p>Data transfer options are based on geographical location or require on-premises gear and per-GB charges</p> <p>Maximum object size is 5 TB</p> <p>Data-at-rest encryption available upon request per item</p> <p>5 GB of free storage space for one year</p>
Block storage	<p>Attach up to eight instances to each block storage volume</p> <p>Up to 48K IOPS with Endurance or Performance tier block storage</p>	<p>Attach one instance per block storage volume</p> <p>Up to 16K IOPS on gp2 volumes or 32K IOPS on io1 without special Nitro instances</p>
Management, monitoring, and tech support	<p>Use Multicloud Manager for Kubernetes environments across IBM, public clouds from other providers, and private clouds</p> <p>Operations Analytics can offer predictive maintenance and increased efficiency</p> <p>Free basic tech support with 24/7 access</p> <p>Offers 15-minute to four-hour wait times for high-tier tech support</p>	<p>No multi-cloud management</p> <p>No AI-controlled predictive analytics</p> <p>No free tech support, and basic tech support is available only during business hours</p> <p>Offers up to 24-hour wait times for high-level tech support</p>



## Conclusion

Navigating the cloud provider landscape can be complicated. Organizations should be able to find a cloud platform that meets their business needs and goals. Although many people have heard of AWS and are familiar with its offerings, we found that IBM Cloud has some competitive advantages that any organization interested in public cloud should consider. We reviewed publicly available information on both platforms, and there are many configuration advantages for IBM Cloud compared to AWS as well as management, monitoring, and support features that AWS doesn't have.

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This project was commissioned by IBM.



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