The Importance of Data's Physical Location in the Cloud

Improve user experience by optimising cloud network performance

EXECUTIVE SUMMARY

The abstract nature of cloud computing implies that the physical location of data is irrelevant within the cloud. Business transactions occur across international borders. Big data created in one location can then be stored, processed and pulled from other locations. End users with Internet access can be anywhere in the world. However, the network performance implications of physical distance still apply to all cloud providers and providers must ensure that data moves efficiently with minimal latency across and between networks.

IBM® Cloud invests heavily to build, maintain and grow our global network backbone to transport public and private network traffic, providing customers with the best network performance in cloud computing.

IBM

Does location matter in the cloud?

Businesses often choose to move data into the cloud so their data can be stored, processed and delivered quickly and reliably anywhere in the world. With universal accessibility, guaranteed uptime service level agreements and high-speed network connectivity, the actual location of the data is often overlooked. This leads to slow uploads or downloads, delays in service a reduction in productivity and even lost customers or business deals.

While it's true that the physical infrastructure is only an abstract when it comes to customer cloud offerings, data stored on any cloud service is indeed hosted in a physical location. That data's location plays a huge role in how quickly and reliably it can be accessed by users around the world.

Cloud needs to be **fast** and **flexible** and now more than ever, it needs to be **global** and **local**.

Downloading a 10GB (Gigabyte) file from a data center on the other side of the globe takes much longer than the same download from a closer data center. While geographic proximity may not seem to impact performance on smaller scales, it actually plays a huge role in a user's experience.

Minimising Network Variables

Network speed tests deliver **performance metrics** that are location and
provider agnostic and can be compared easily.

The longer a single provider has control of traffic on its own network, the more efficiently that traffic will move. Depending on network congestion, bandwidth partner quotas, and the number of different network providers involved in the path, cloud providers without a global network are subject to much higher variability in network performance.

IBM® spent millions of dollars to build, maintain and grow our global network backbone to control many of the variables that lead to higher (or inconsistent) latency to and from a given data center. These benefits are great in theory. In practice, they're even more impressive. Bluemix provides access network speed tests in each of our data centers to show the performance of our network in real time.

By using network speed tests, businesses can compare the network performance of different locations and providers using consistent metrics like latency, upload/download speeds and packet loss.

These tests can be very revealing, and the results are often surprising. Cloud providers with data center locations in the same city may return dramatically different speeds and latency to the same testing endpoint.

Customer Scenario

Half of a business's user base is in Paris and the other half is in Singapore. If the business chooses to host its cloud infrastructure exclusively from Paris, its users would see dramatically different results. Users in Paris would have sub-10ms (milliseconds) latency while users in Singapore have about 300ms of latency.

**SINGAPORE**   **SAN JOSE**   **PARIS**

The best-case scenario is for the business to choose a location with roughly the same latency to both markets. San Jose, California (SJC01) would be a logical midpoint. Both would experience very similar performance, the users in the two markets won't necessarily experience high network speeds, but neither will experience low speeds either.

The IBM Cloud Network

All IBM Cloud data centers and network PoPs (points of presence) that support Bluemix cloud resources are connected to our unique global network backbone, which carries public, private and management traffic to and from servers. Our global network boasts more than 2,600Gbps (Gigabits per second) of connectivity between data centers and network PoPs and our network PoPs have more than 2,500Gbps of transit and peering connectivity to the Internet.

When you access an IBM Bluemix server, the network brings you onto our global backbone as quickly as possible at one of our network PoPs. Then customers and end users experience fewer hops (and a more direct route that IBM controls). When a user requests data from a Bluemix server, that data travels to the nearest network PoP, where it's handed off to another provider to carry the data the remaining distance.

- Data Center & Network PoP
- Bluemix Public Region
- Network PoP
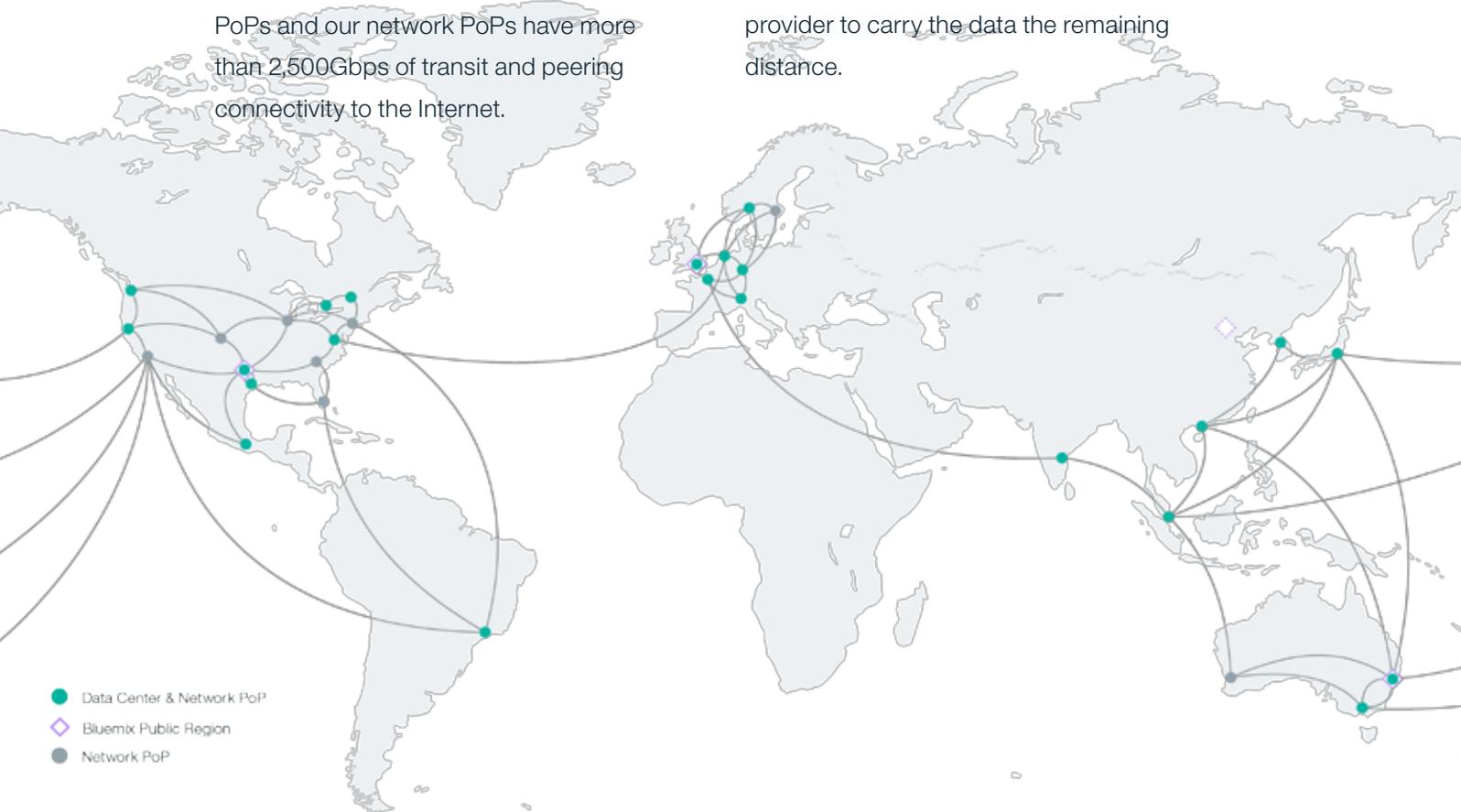
Testing the IBM Cloud Network

Bluemix provides free access to real-time data center speed tests for customer reference with data center speed tests. Downloadable files, traceroute addresses and browser-based speed tests are available for all IBM Cloud data centers that support Bluemix cloud workloads.

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http://www.ibm.com/bluemix/data-centers

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