

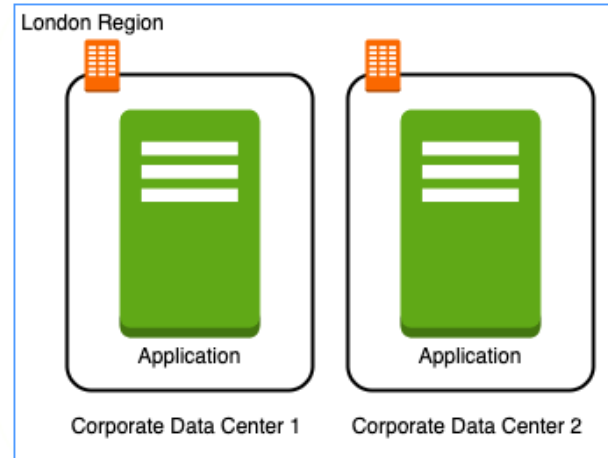
Regions and Zones

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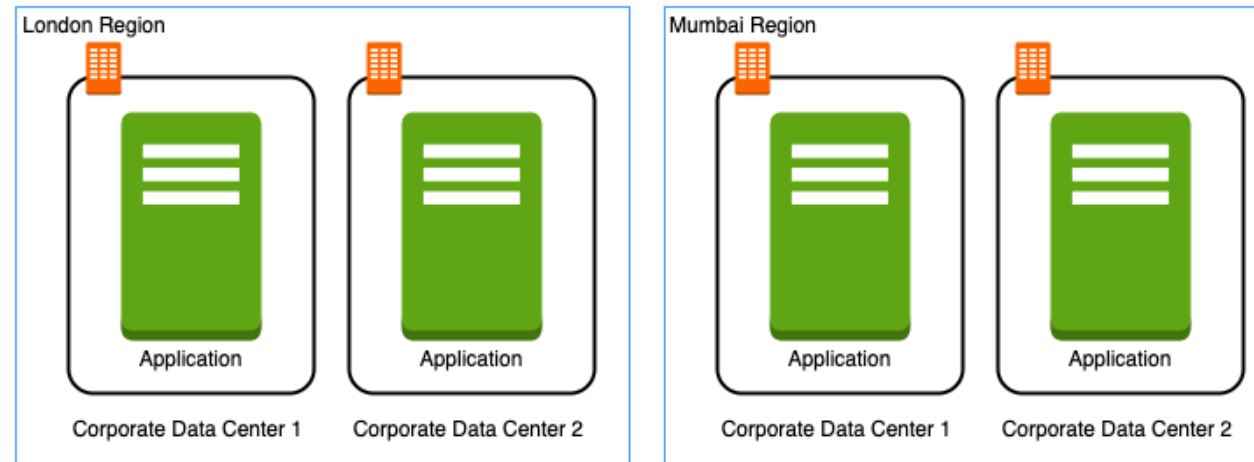
- Imagine that your application is deployed in a data center in London
- What would be the challenges?
 - Challenge 1 : Slow access for users from other parts of the world (**high latency**)
 - Challenge 2 : What if the data center crashes?
 - Your application goes down (**low availability**)

Multiple data centers



- Let's add in one more data center in London
- What would be the challenges?
 - Challenge 1 : Slow access for users from other parts of the world
 - Challenge 2 (**SOLVED**) : What if one data center crashes?
 - Your application is **still available** from the other data center
 - Challenge 3 : What if **entire region** of London is unavailable?
 - Your application goes down

Multiple regions



- Let's add a new region : Mumbai
- What would be the challenges?
 - Challenge 1 (**PARTLY SOLVED**) : Slow access for users from other parts of the world
 - You can solve this by adding deployments for your applications in other regions
 - Challenge 2 (**SOLVED**) : What if one data center crashes?
 - Your application is still live from the other data centers
 - Challenge 3 (**SOLVED**) : What if entire region of London is unavailable?
 - Your application is served from Mumbai

Regions

- Imagine setting up data centers in different regions around the world
 - Would that be easy?
- (Solution) Google provides 20+ regions around the world
 - Expanding every year
- **Region** : Specific geographical location to host your resources
- **Advantages:**
 - High Availability
 - Low Latency
 - Global Footprint
 - Adhere to government regulations



Zones

- How to achieve high availability in the same region (or geographic location)?
 - Enter Zones
- Each Region has three or more zones
- (Advantage) Increased availability and fault tolerance within same region
- (Remember) Each Zone has one or more discrete clusters
 - **Cluster**: distinct physical infrastructure that is housed in a data center
- (Remember) Zones in a region are connected through low-latency links



Regions and Zones examples

New Regions and Zones are constantly added

Region Code	Region	Zones	Zones List
us-west1	The Dalles, Oregon, North America	3	us-west1-a us-west1-b us-west1-c
eu-north1	Helsinki, Finland, Europe	3	eu-north1-a, eu-north1-b eu-north1-c
asia-south1	Mumbai, India APAC	3	asia-south1-a, asia-south1-b asia-south1-c