



facebook
INFRASTRUCTURE

Cross Continent Infrastructure Scaling at Instagram

Sherry Xiao

Instagram PE Core

#TBT



**October 6,
2010**



**Moved to FB infra,
2013**



**September,
2012**



**Scaled to three DC,
2014**

#TBT



**Sherry,
2017**



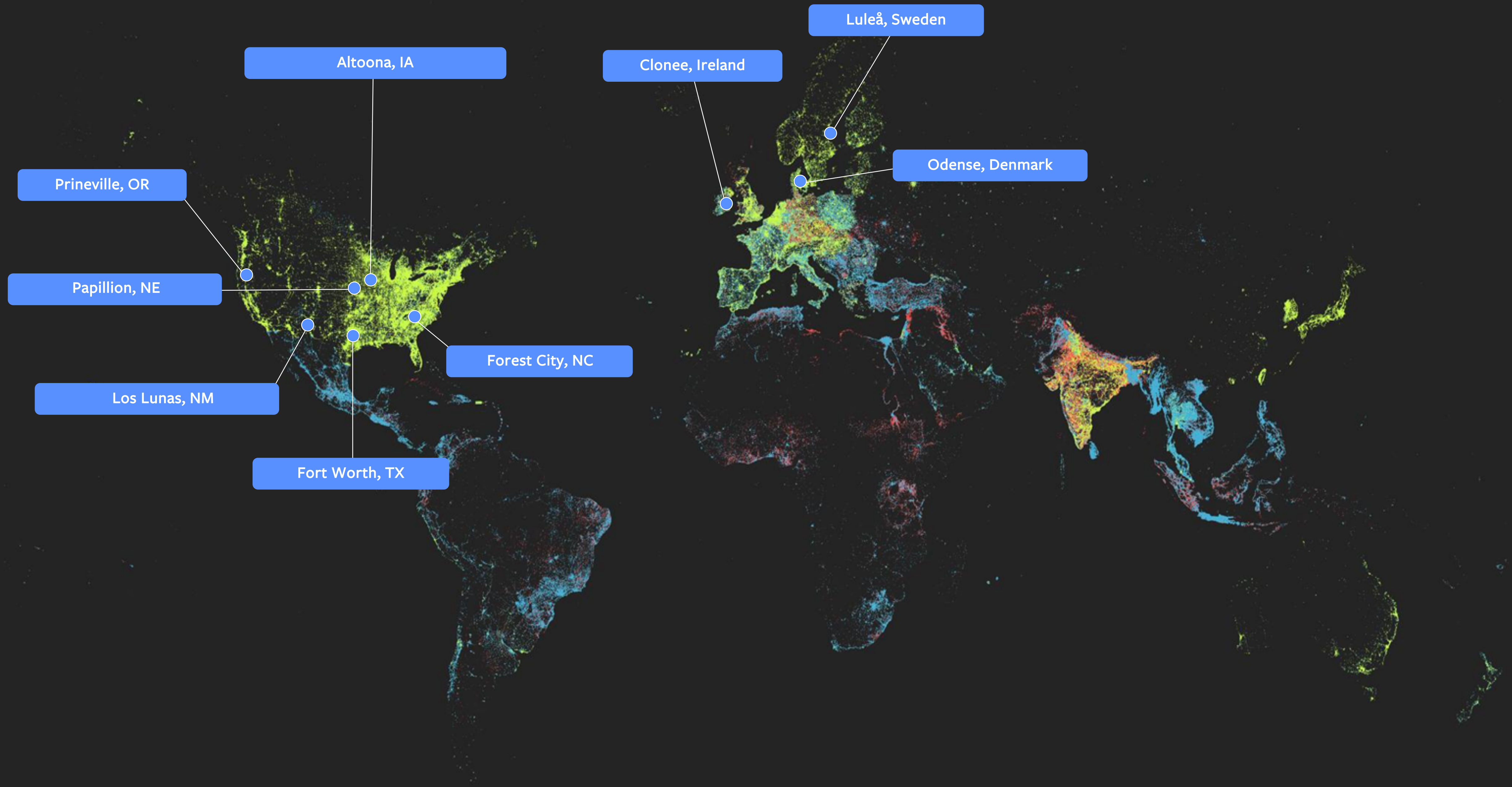
**Turned on EU,
2018**



**1 Billion MAU,
2018**



Singapore in 2022...



Altoona, IA

Clonee, Ireland

Luleå, Sweden

Odense, Denmark

Prineville, OR

Papillion, NE

Forest City, NC

Los Lunas, NM

Fort Worth, TX

Proxygen



Django & uWSGI

TAO

Cassandra

Video

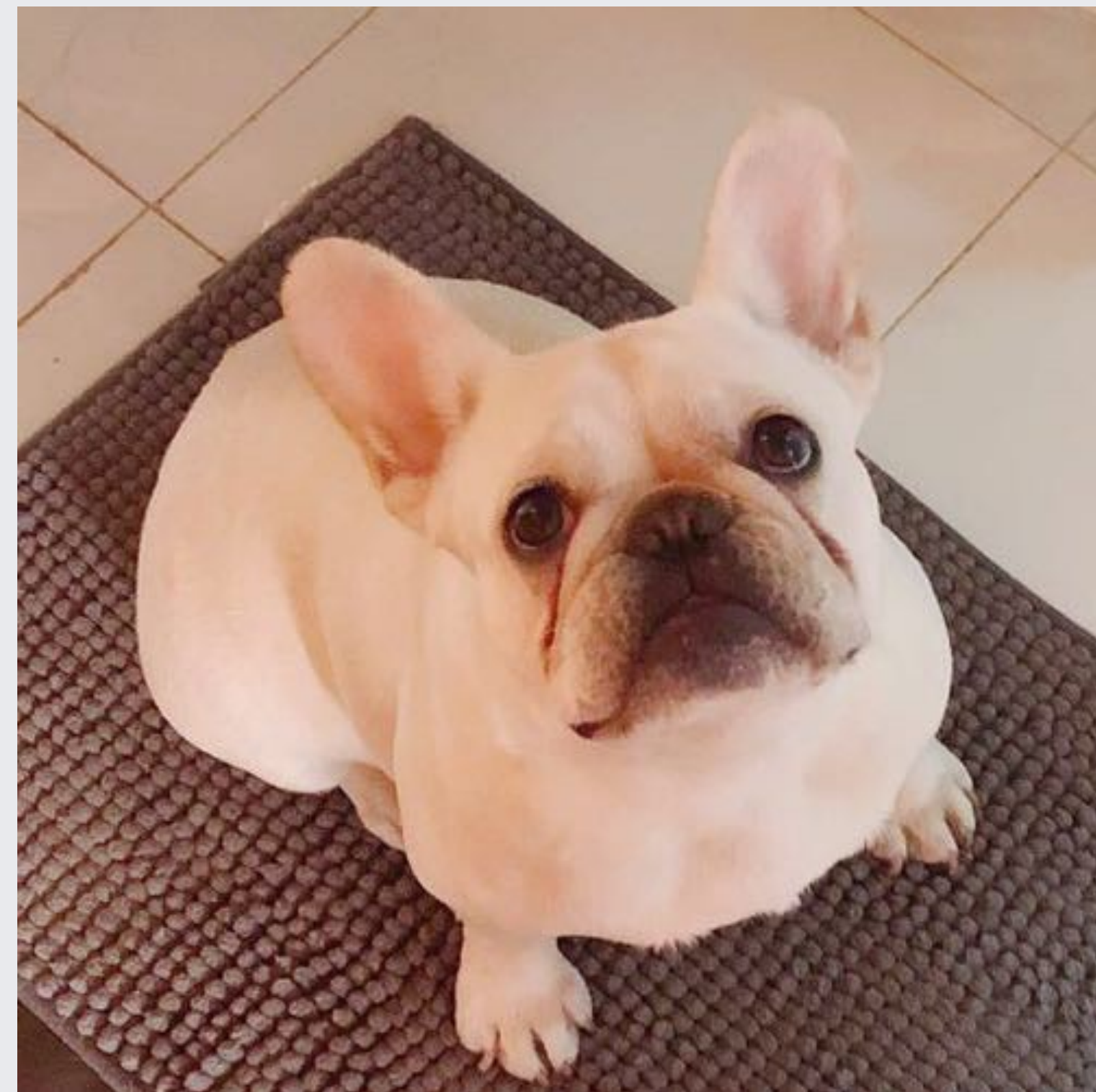
IGML

Async



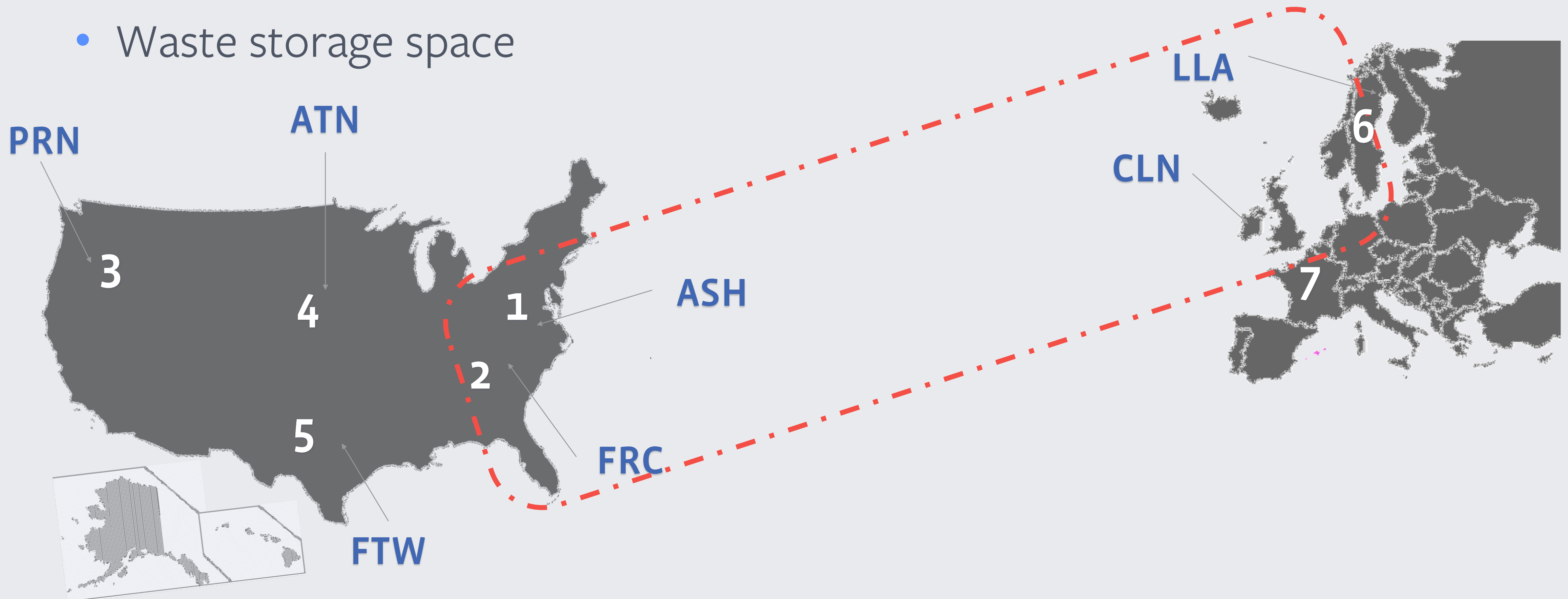
Cassandra Instagram

- Each datacenter has one copy
- Some use cases contain quorum requests
- One user request could contain multiple Cassandra call



Cassandra Instagram

- Quorum requests travel cross ocean
- Too many replicas increase operational complexity
- Waste storage space



Solution

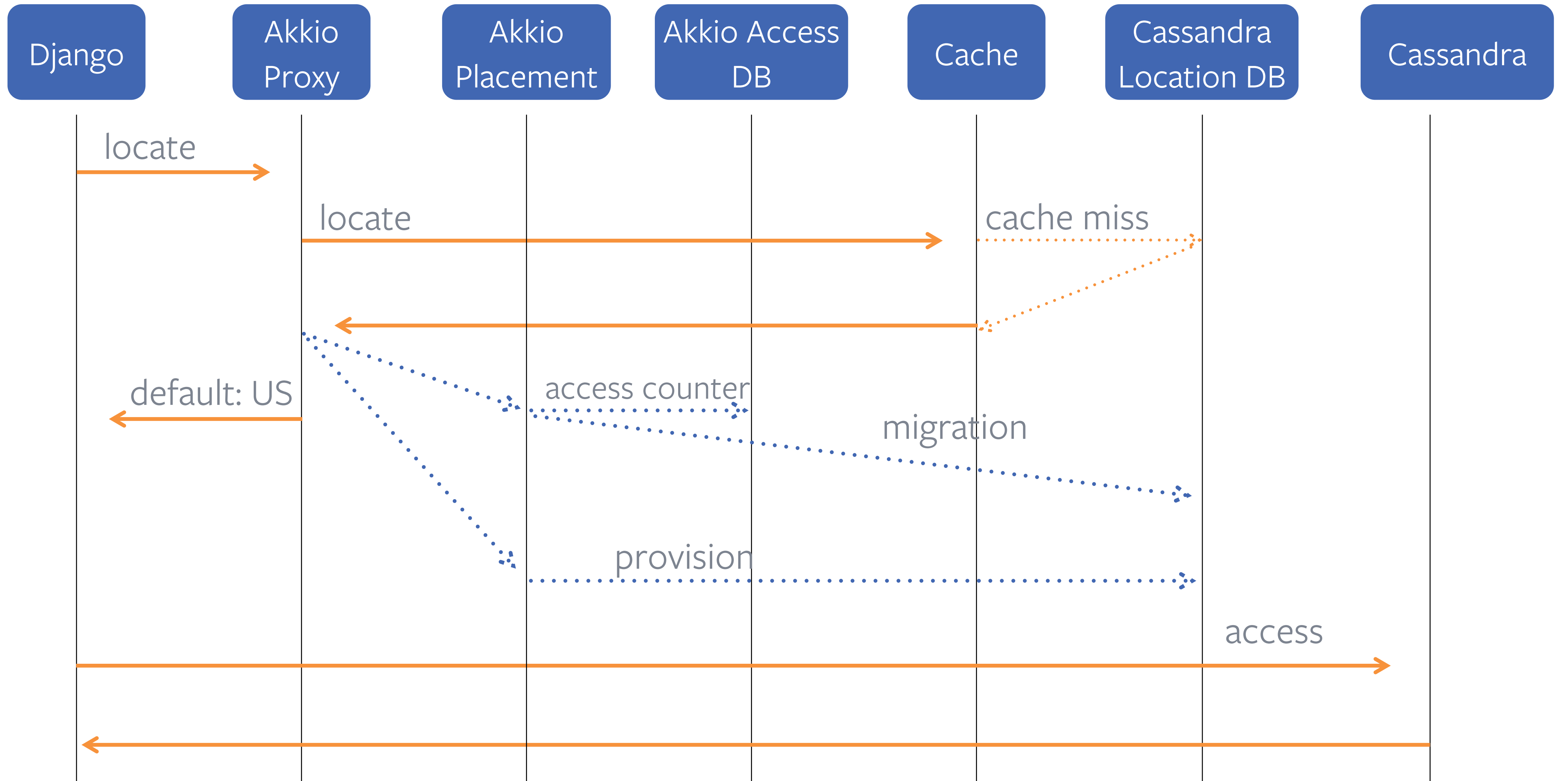


- Akkio is a data placement service
- Akkio helps determine *how and when* to move information in order to optimize retrieval speed
- Split dataset into logical units
- <https://code.fb.com/core-data/akkio/>

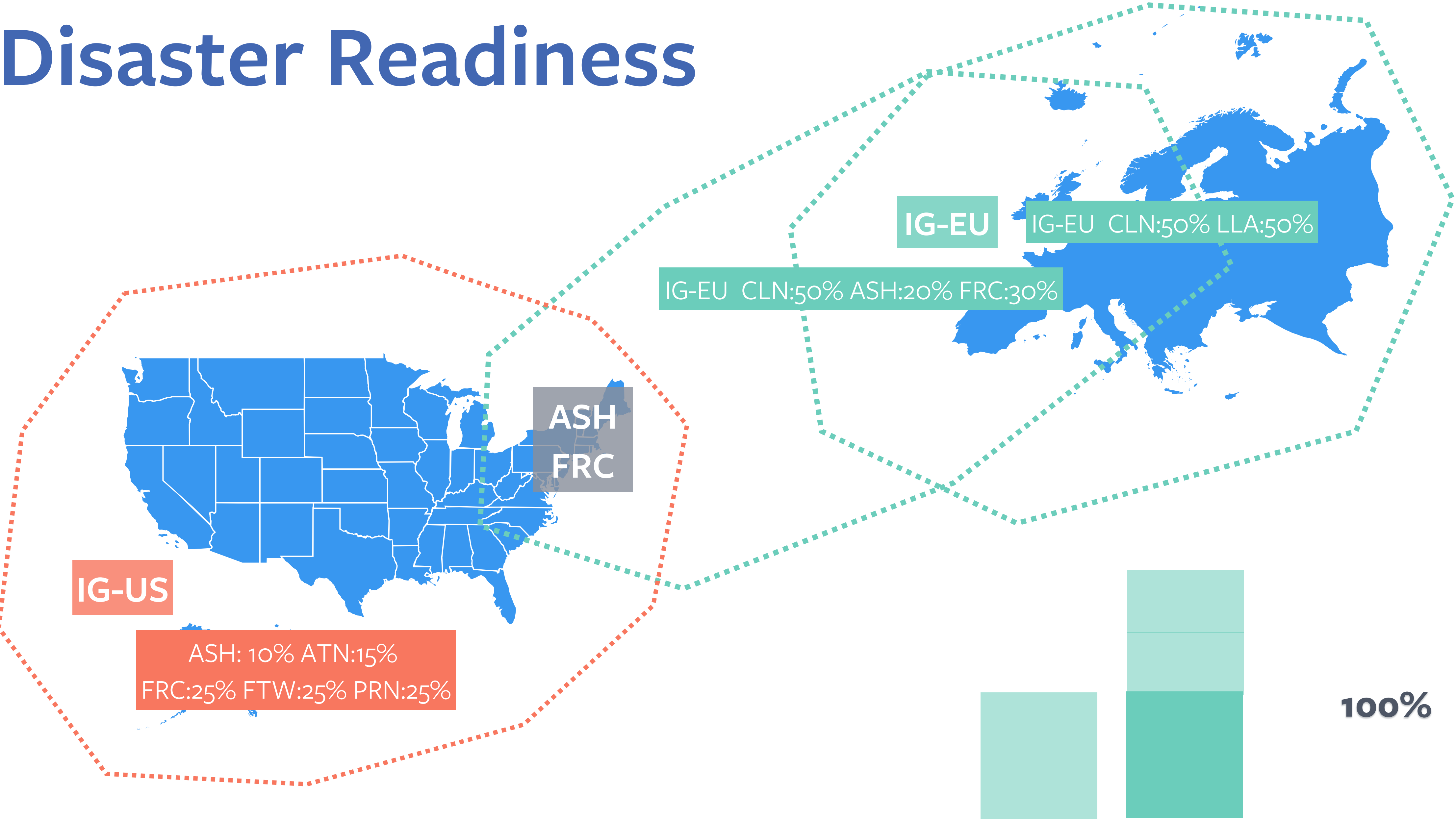
Solution



AKKIO
Optimal Data
Placement
at Facebook



Disaster Readiness

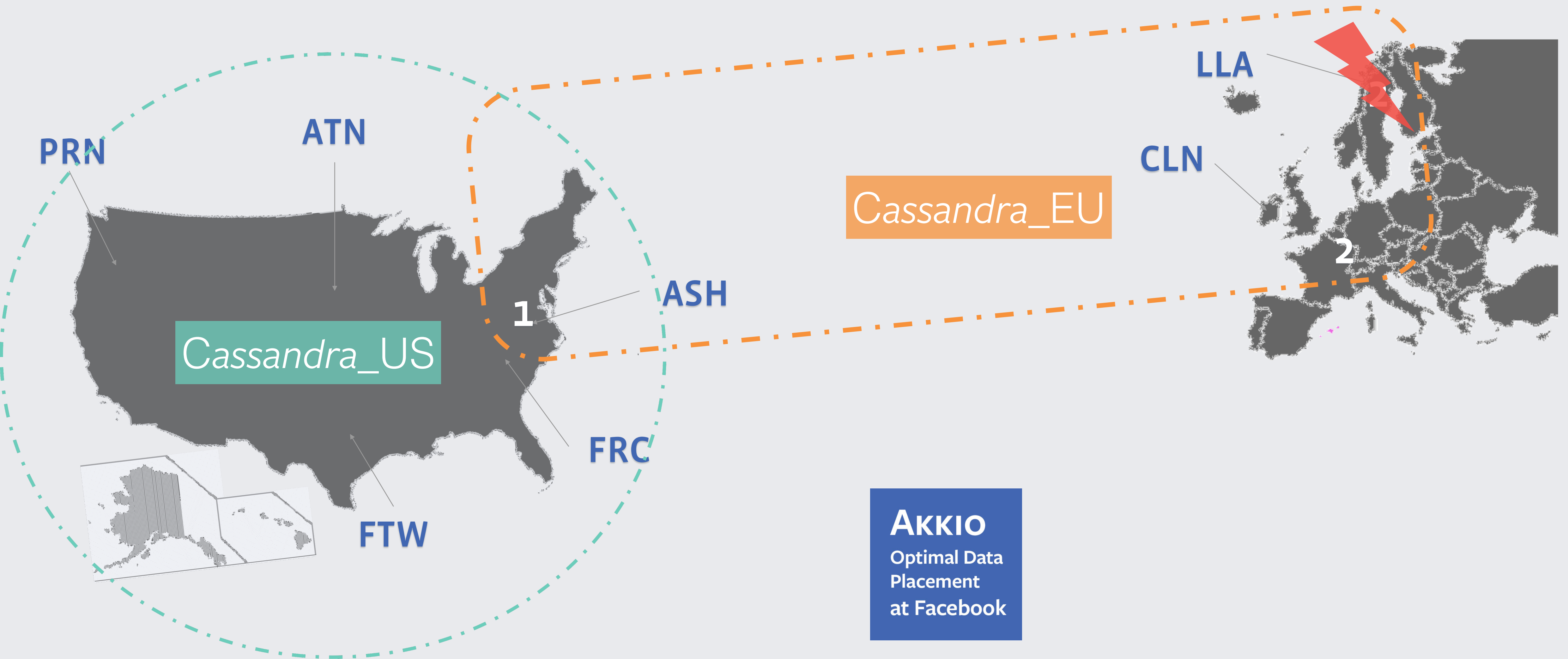


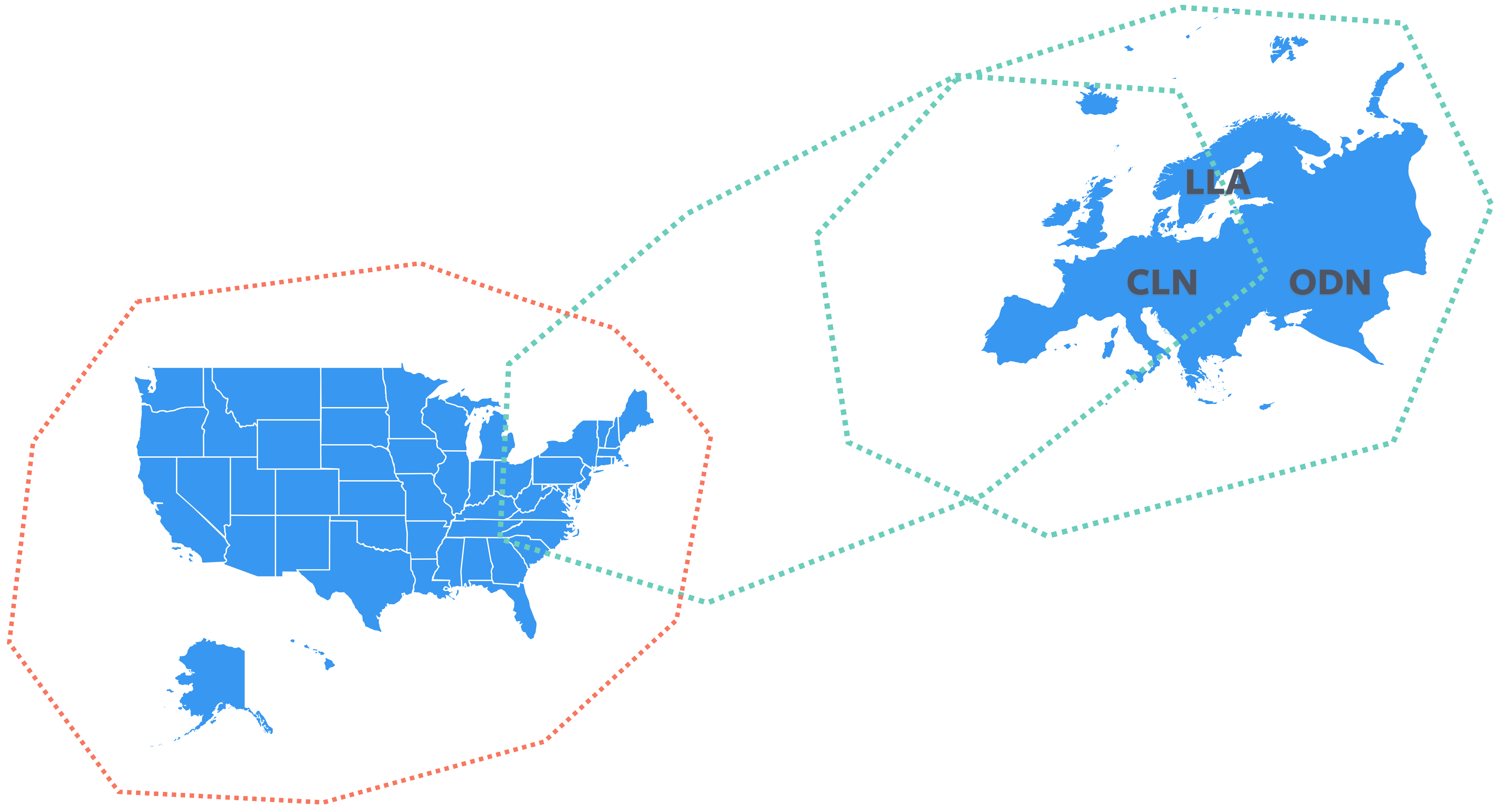
Solution



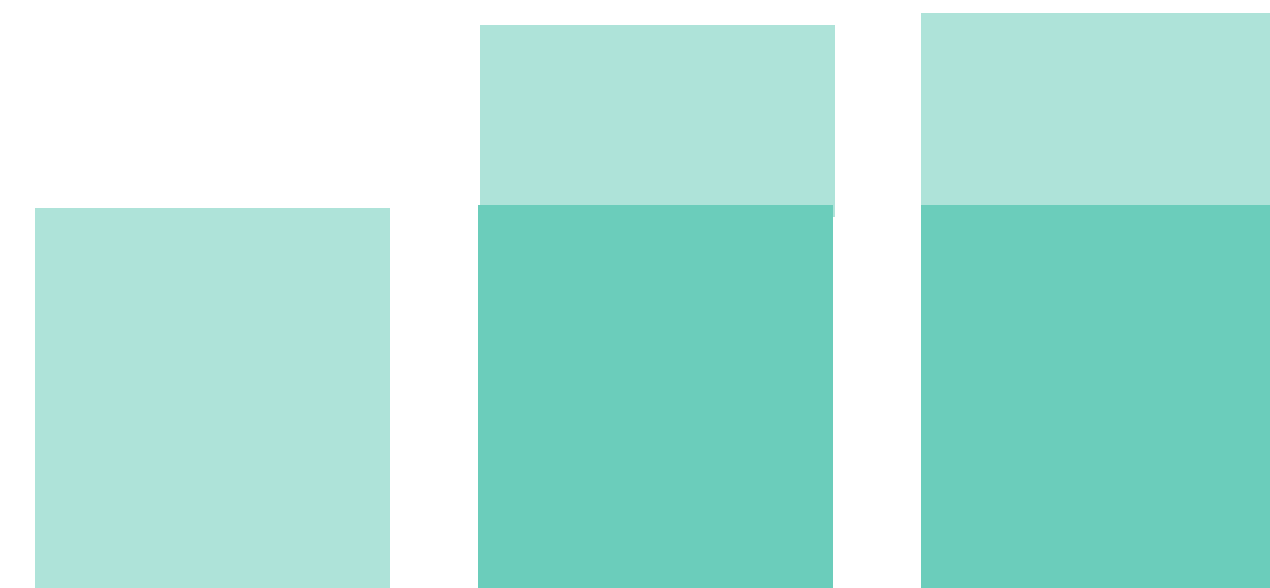
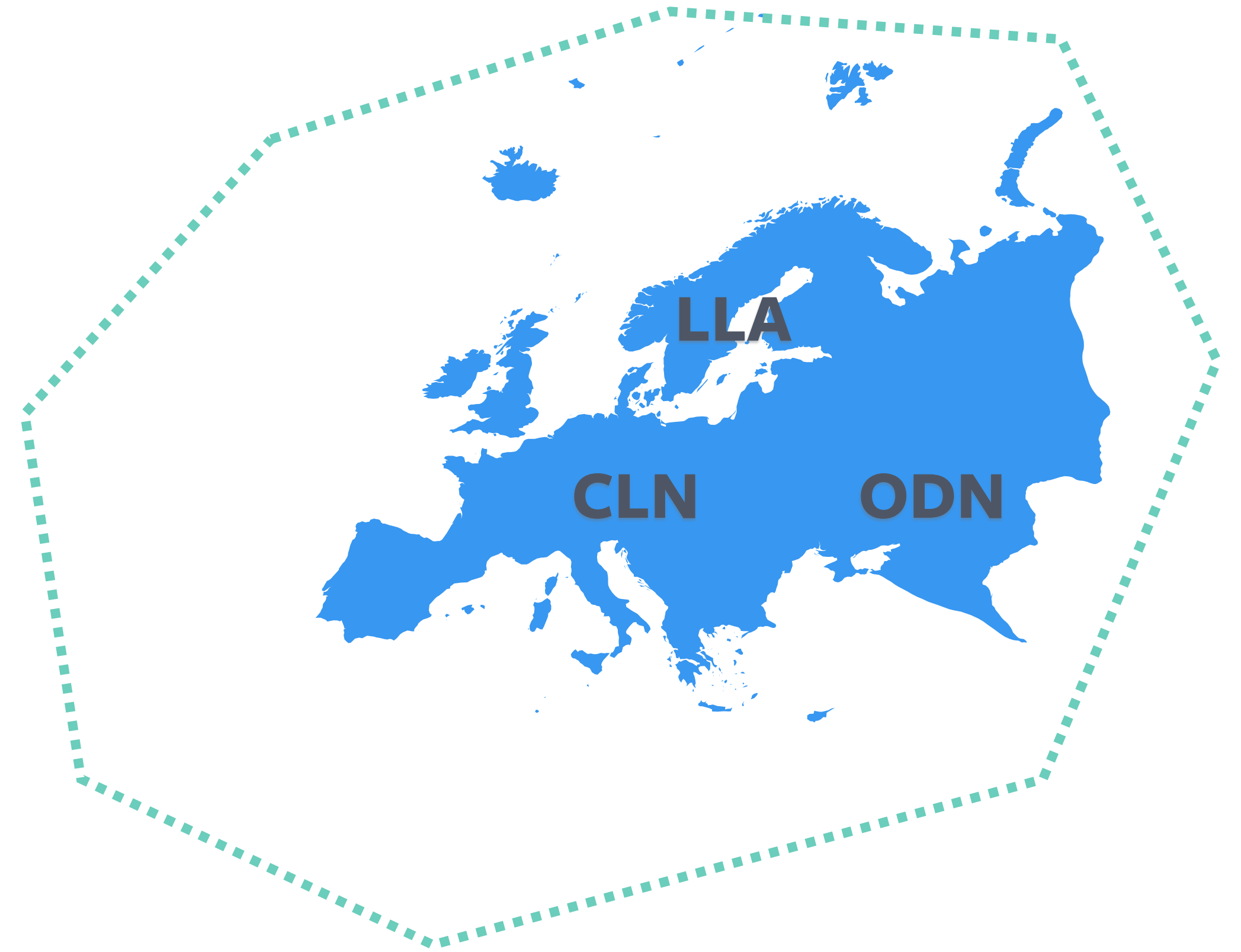
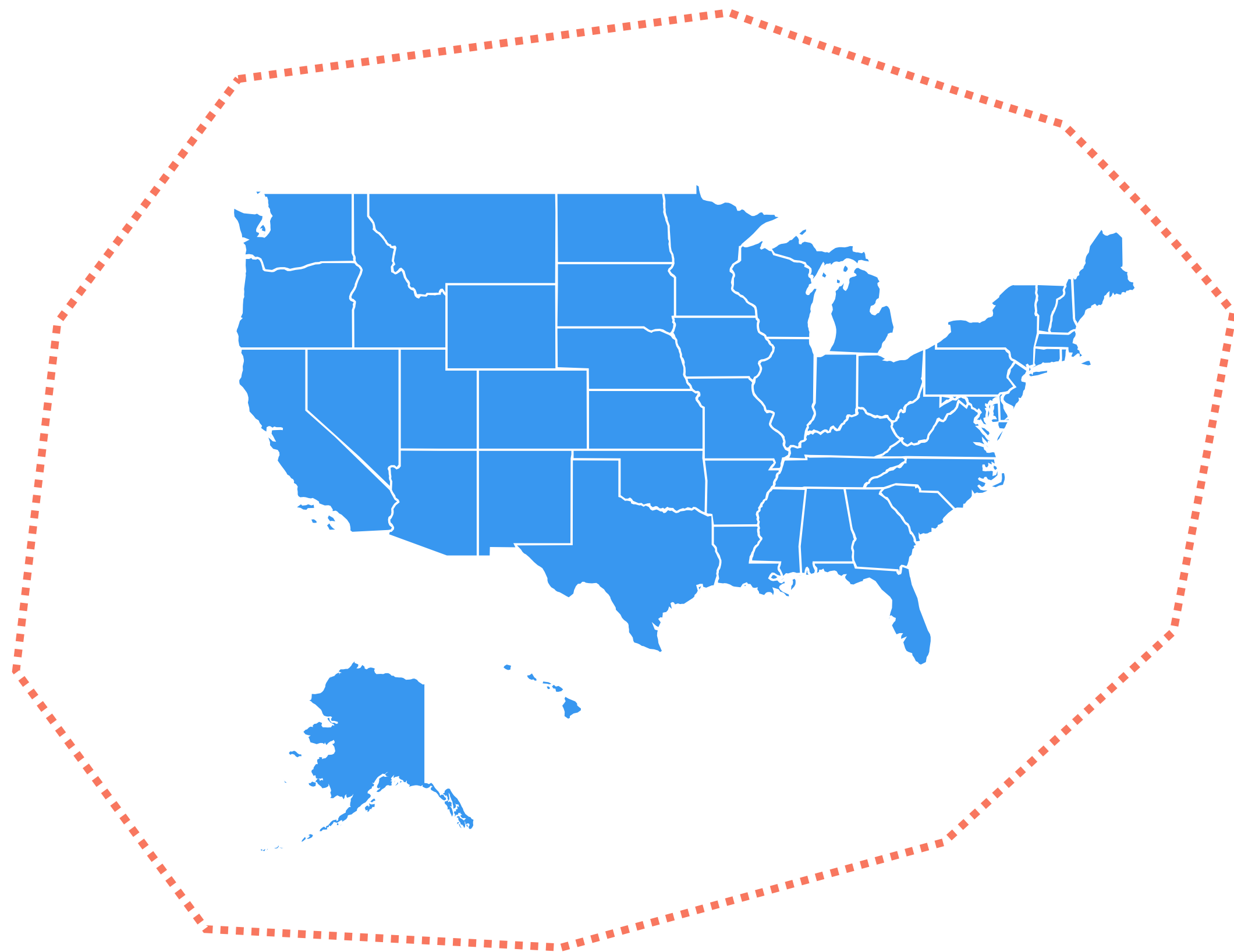
AKKIO
Optimal Data
Placement
at Facebook

Solution

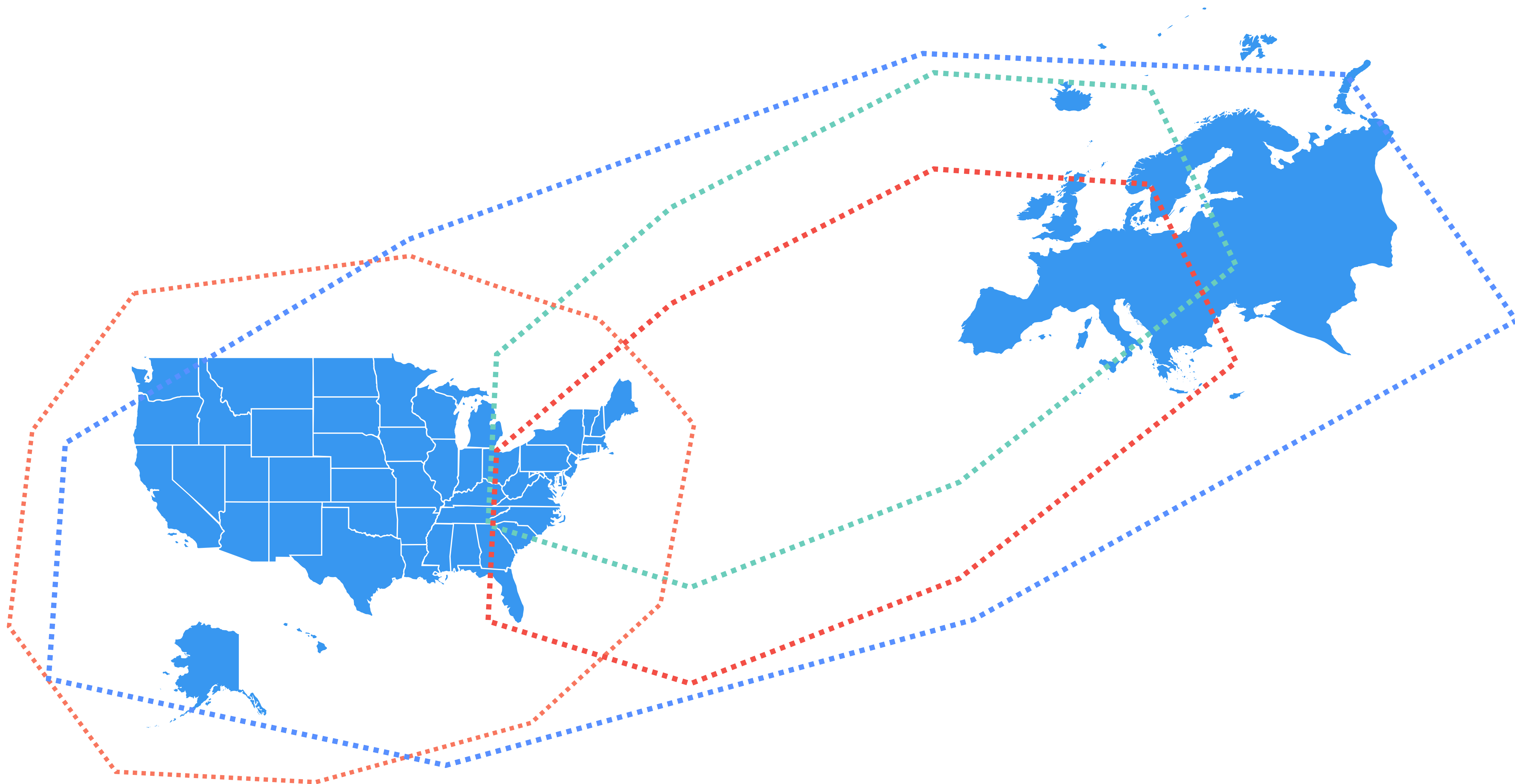




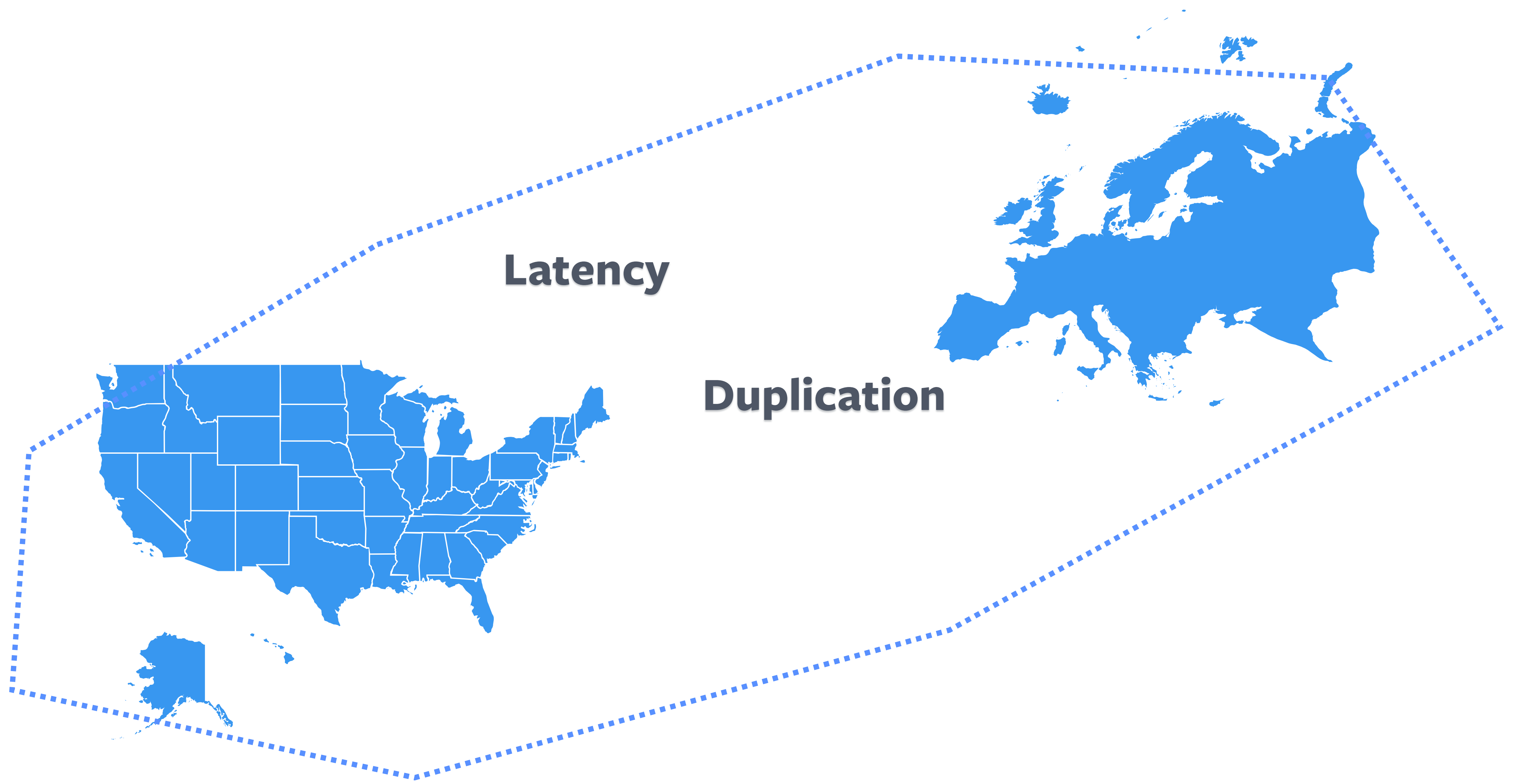
No 😭



50%

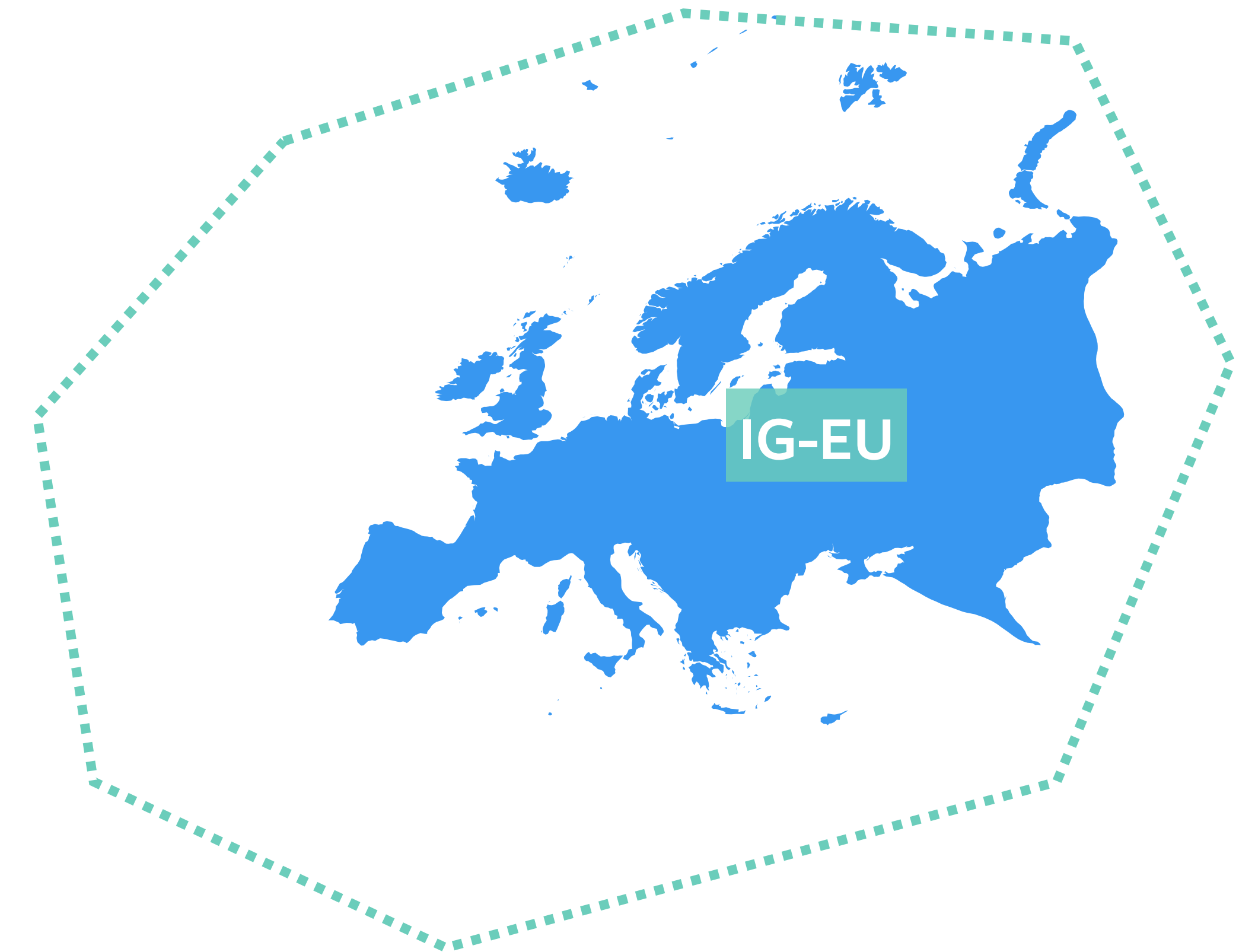
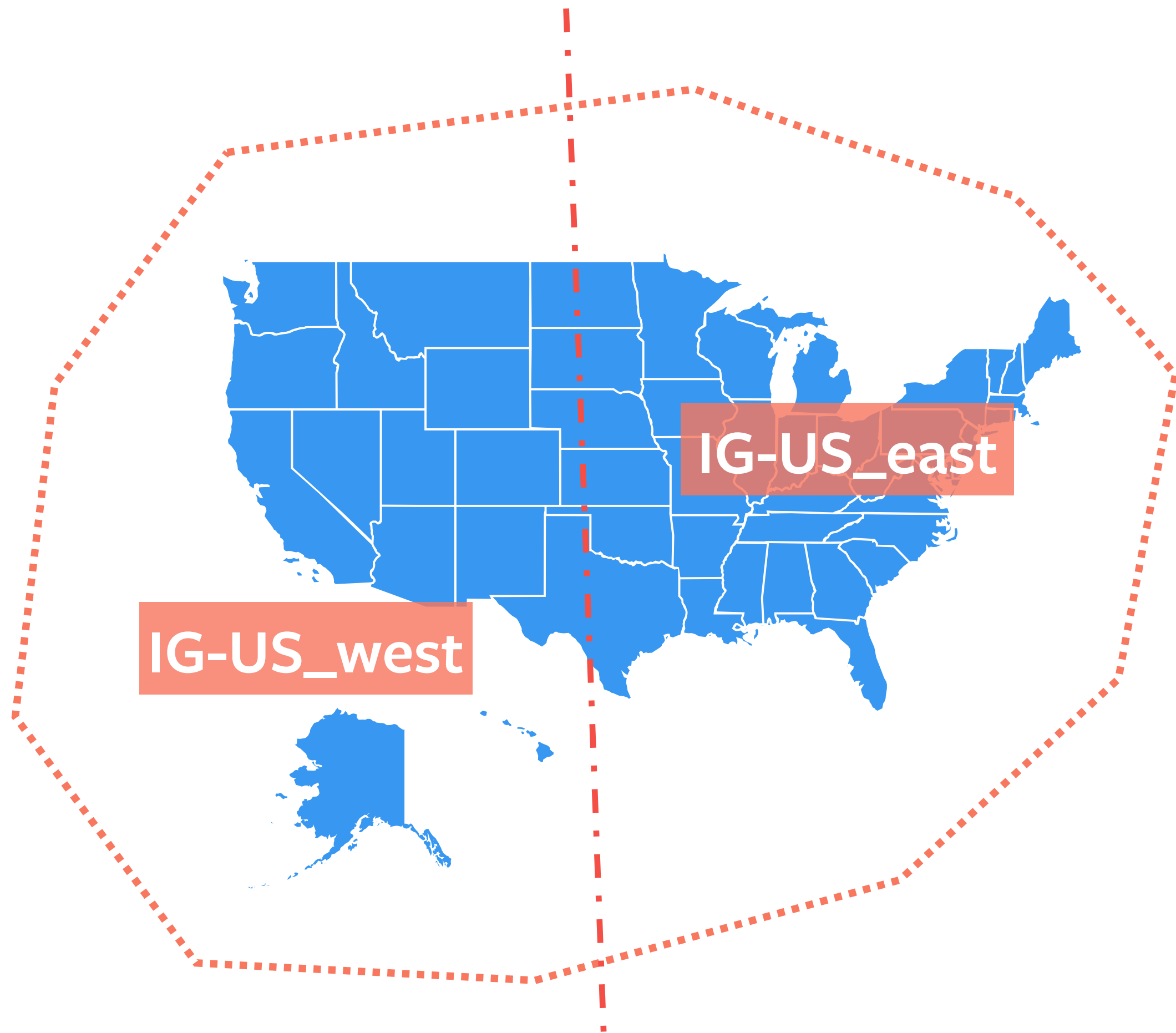


No 😭

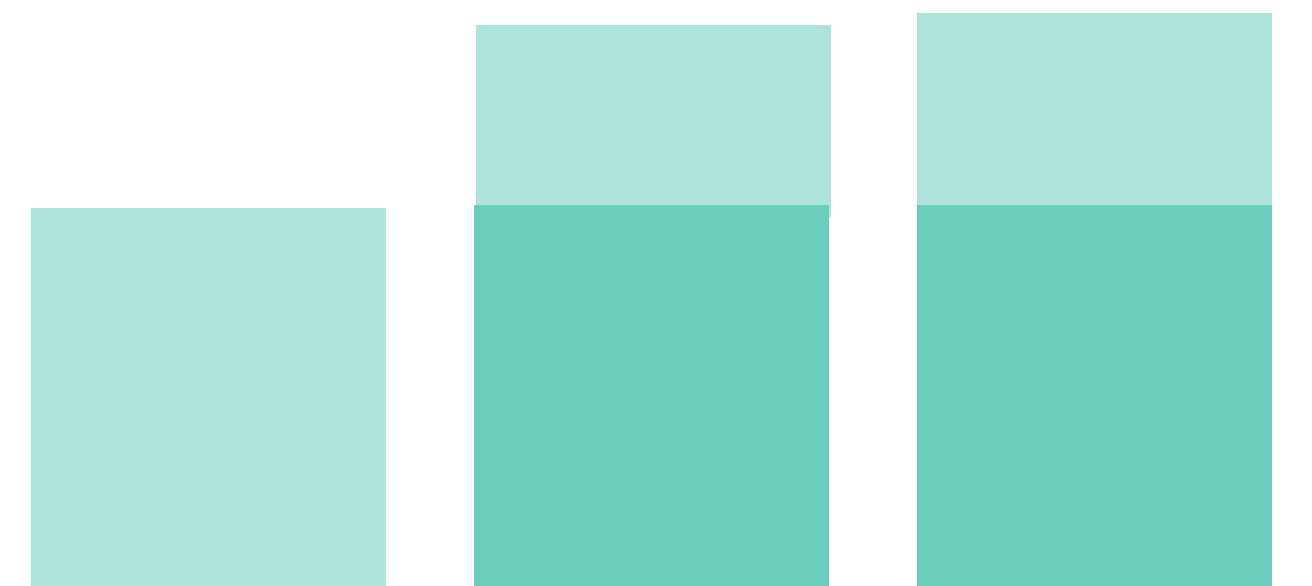
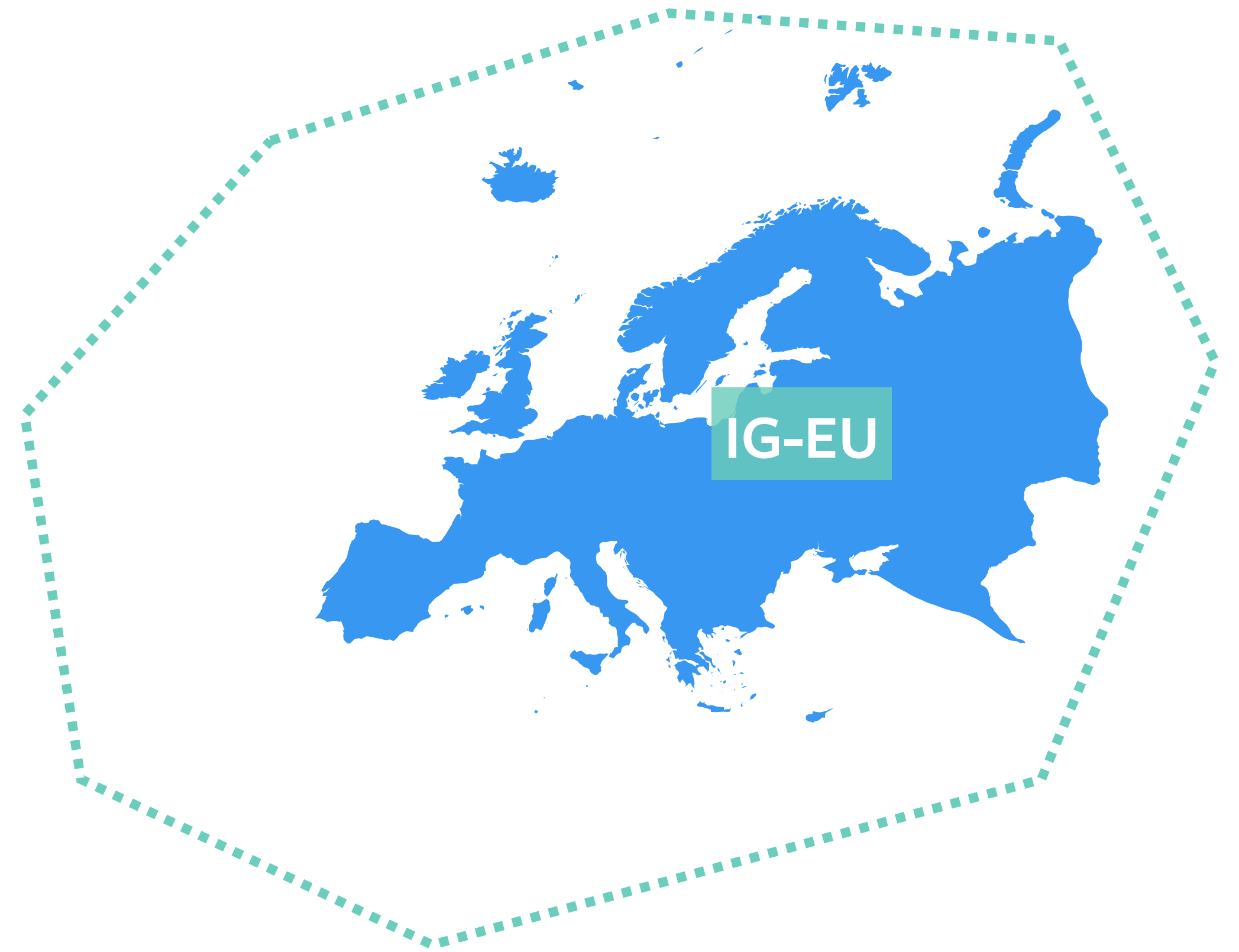
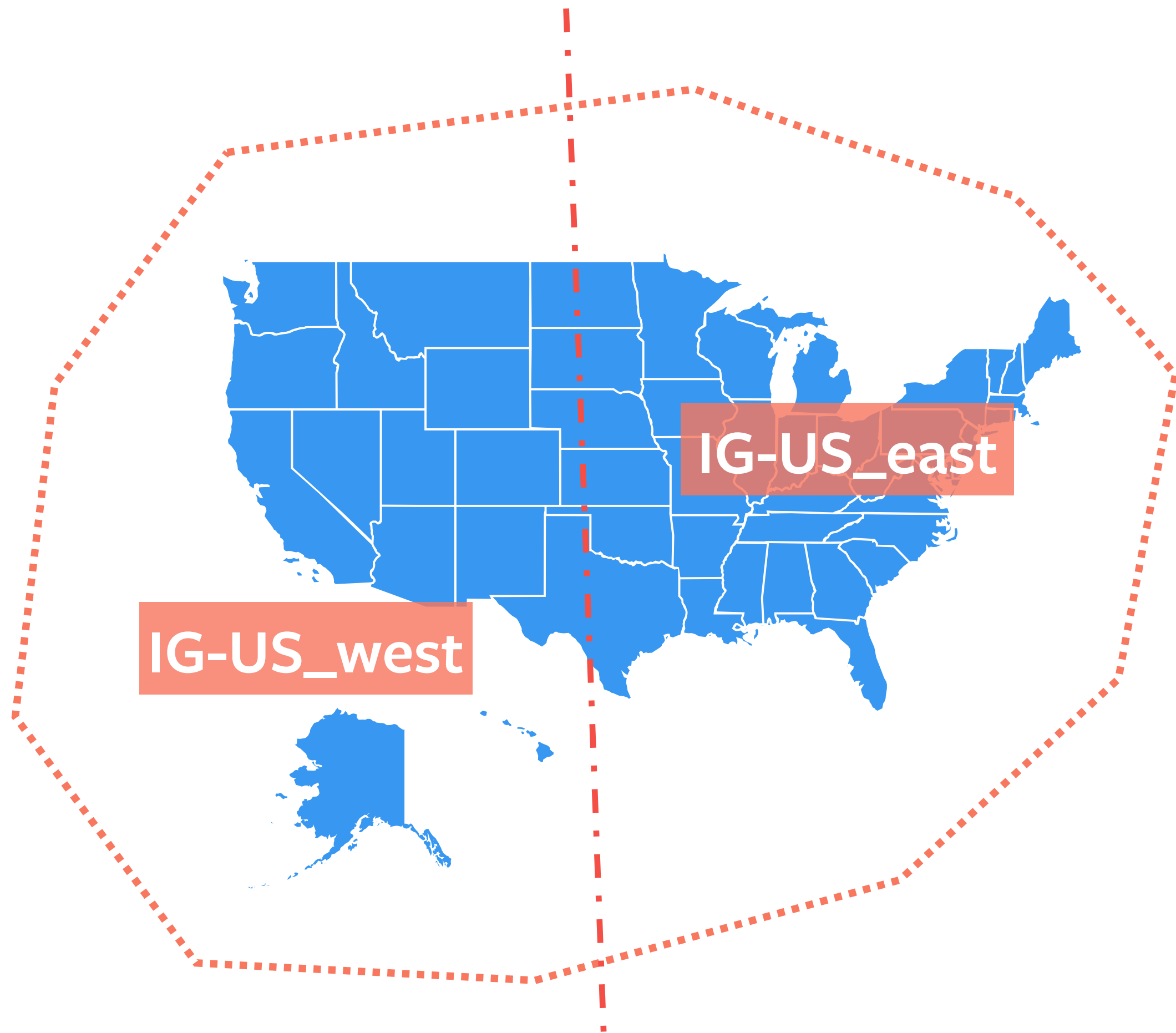


Latency

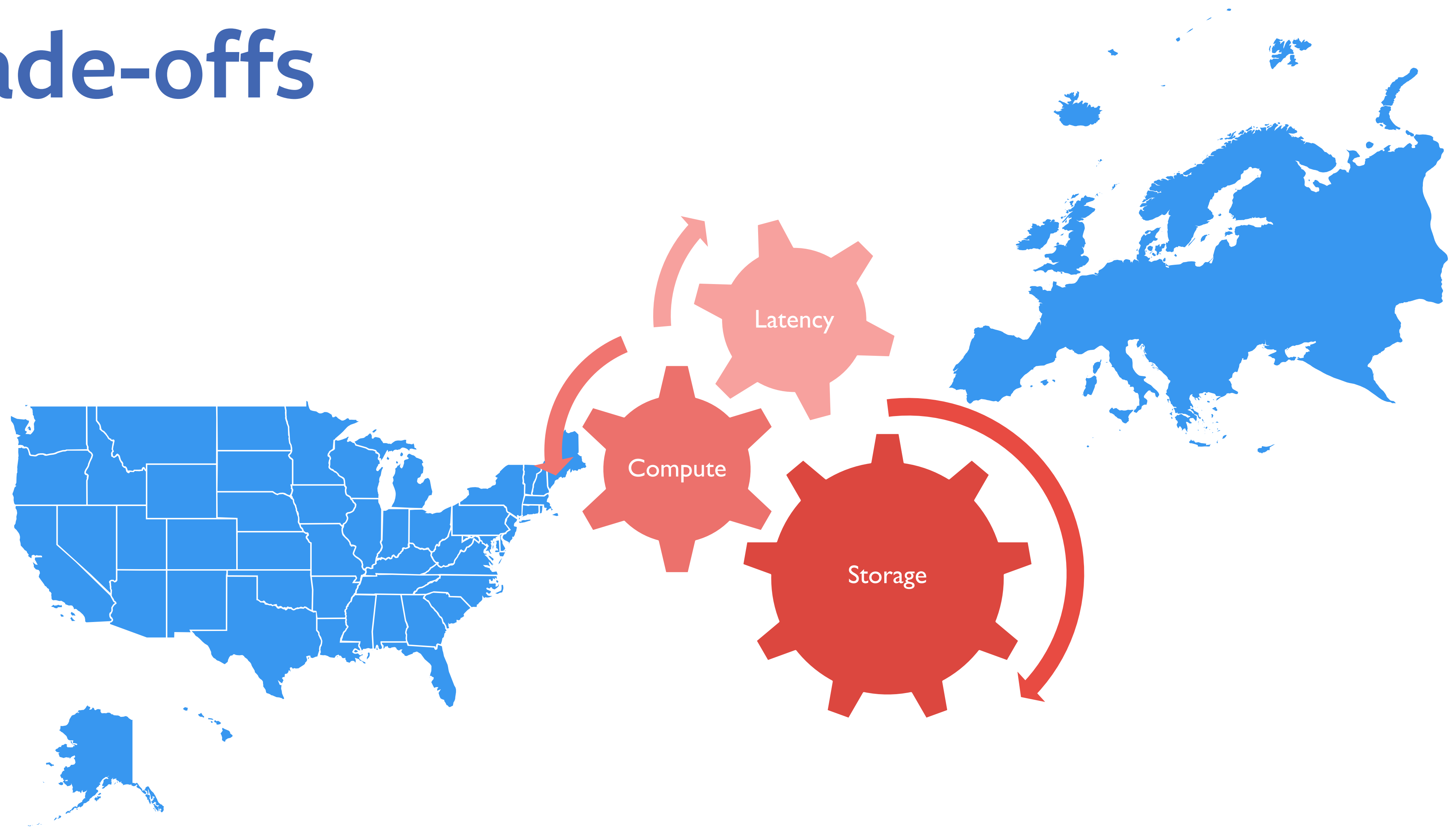
Duplication



No 😭



Trade-offs



Takeaways

👉 **Bring data closer to the user**

Takeaways

👉 Deploy to multiple regions

Takeaways

👉 Partition dataset to reduce replication

Takeaways

 You can't have all

facebook

Thank You!