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CTracker: a Distributed BitTorrent Tracker Based on Chimera

Raul Jimenez, Björn Knutsson

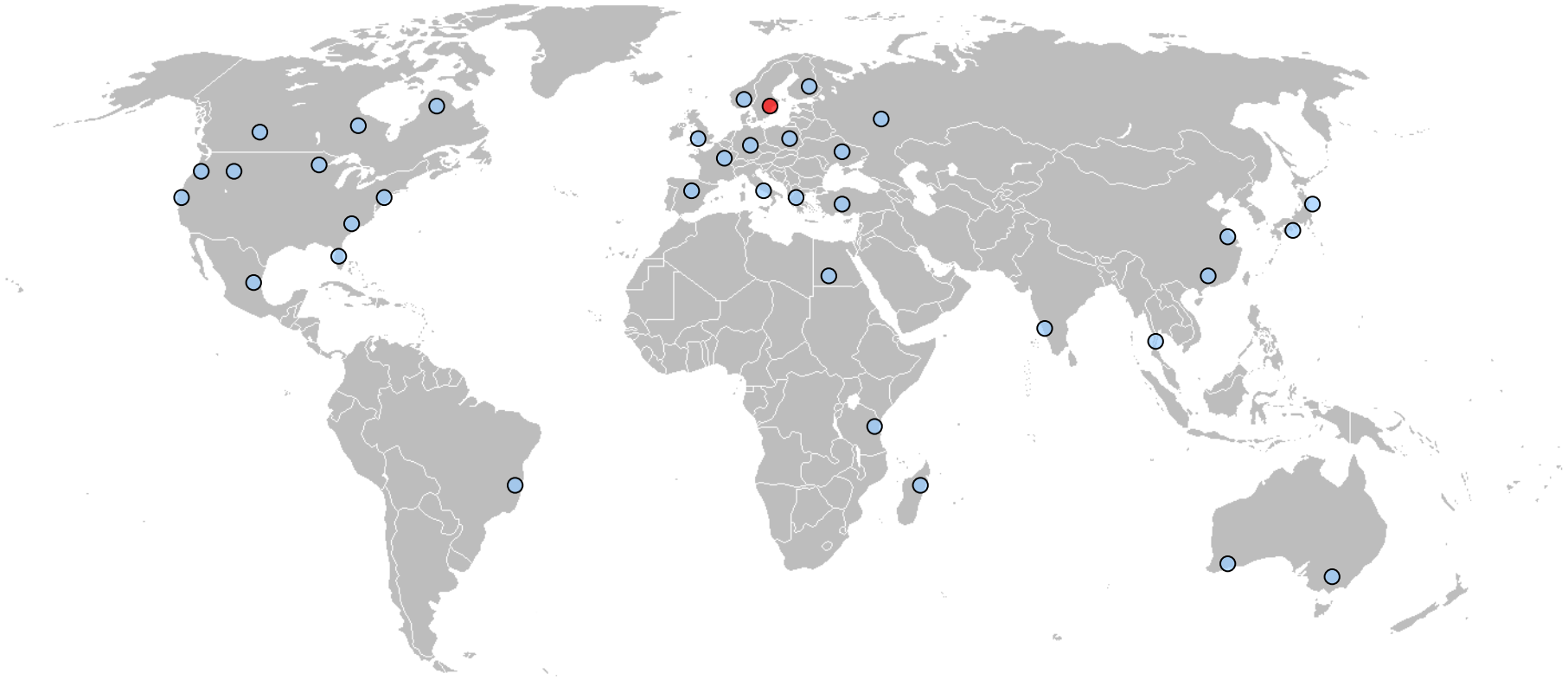
KTH

Sweden

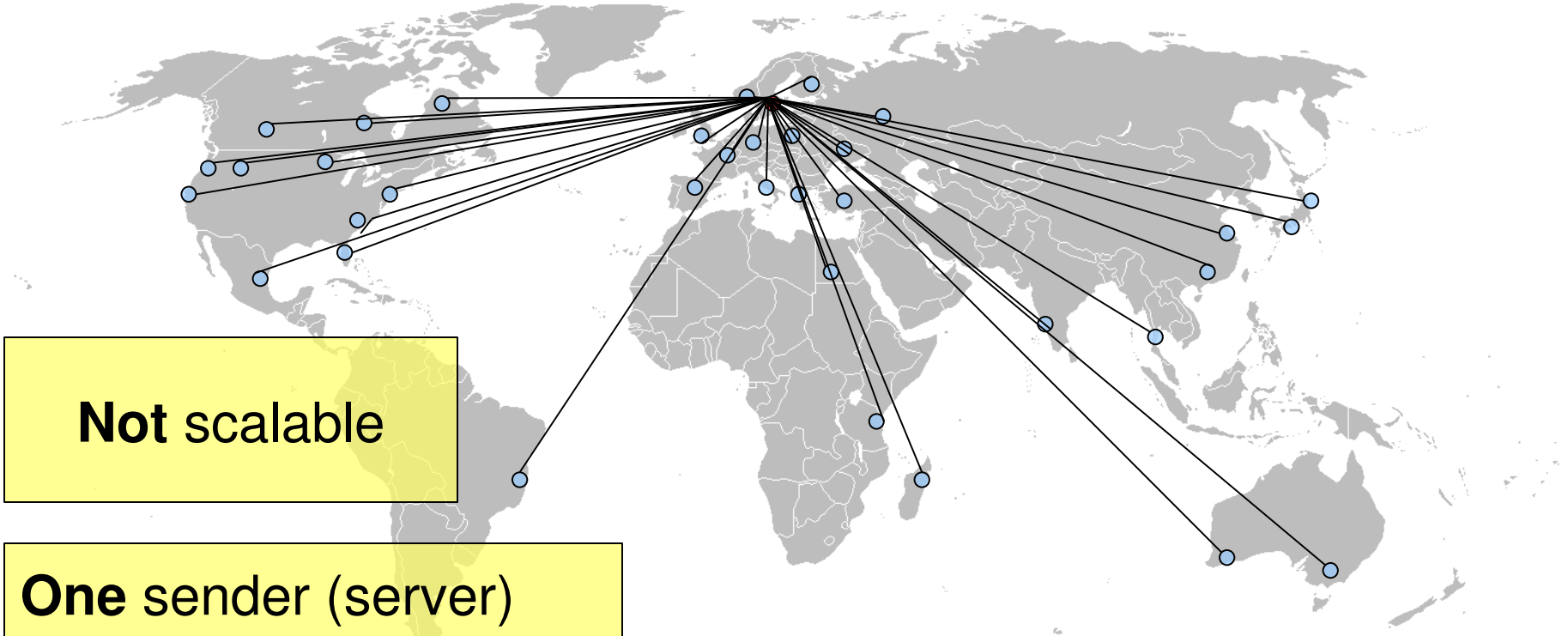
Introduction

- Online content distribution
  - BitTorrent
- Scalability
  - Limited producer's resources
  - Unlimited amount of viewers
- Locality
  - Lower delay
  - Faster download
  - Lower global cost

Content distribution



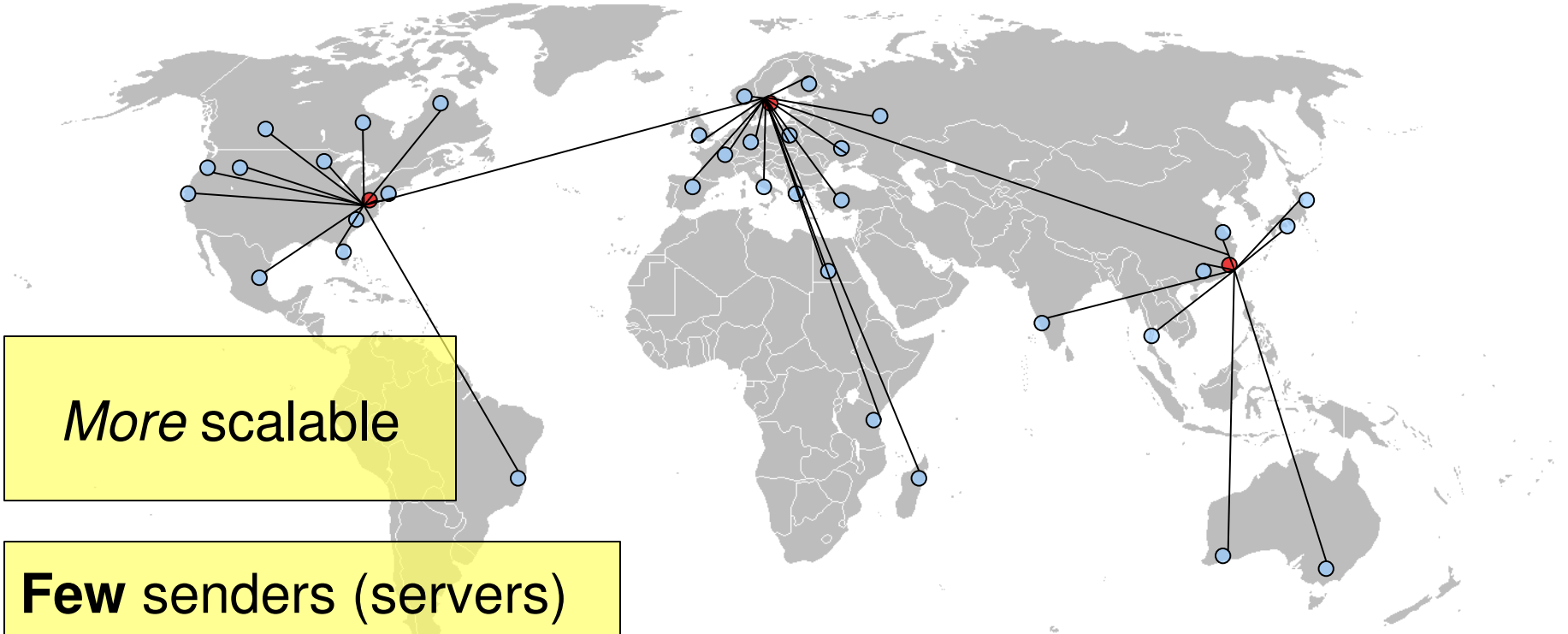
Centralized Distribution



Not scalable

One sender (server)
Many receivers (clients)

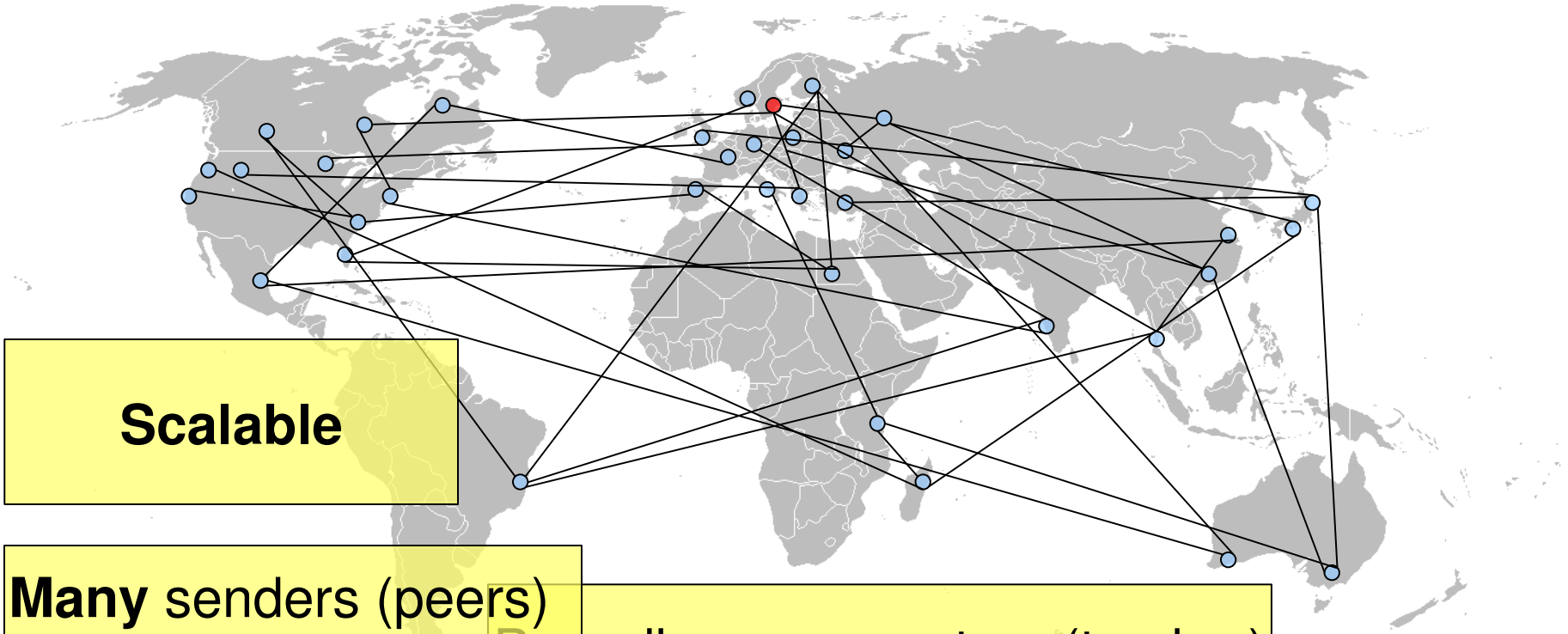
Content Distribution Network



More scalable

Few senders (servers)
Many receivers (clients)

Peer-to-peer



Scalable

Many senders (peers)
Many receivers (peers)

Peer discovery system (tracker)

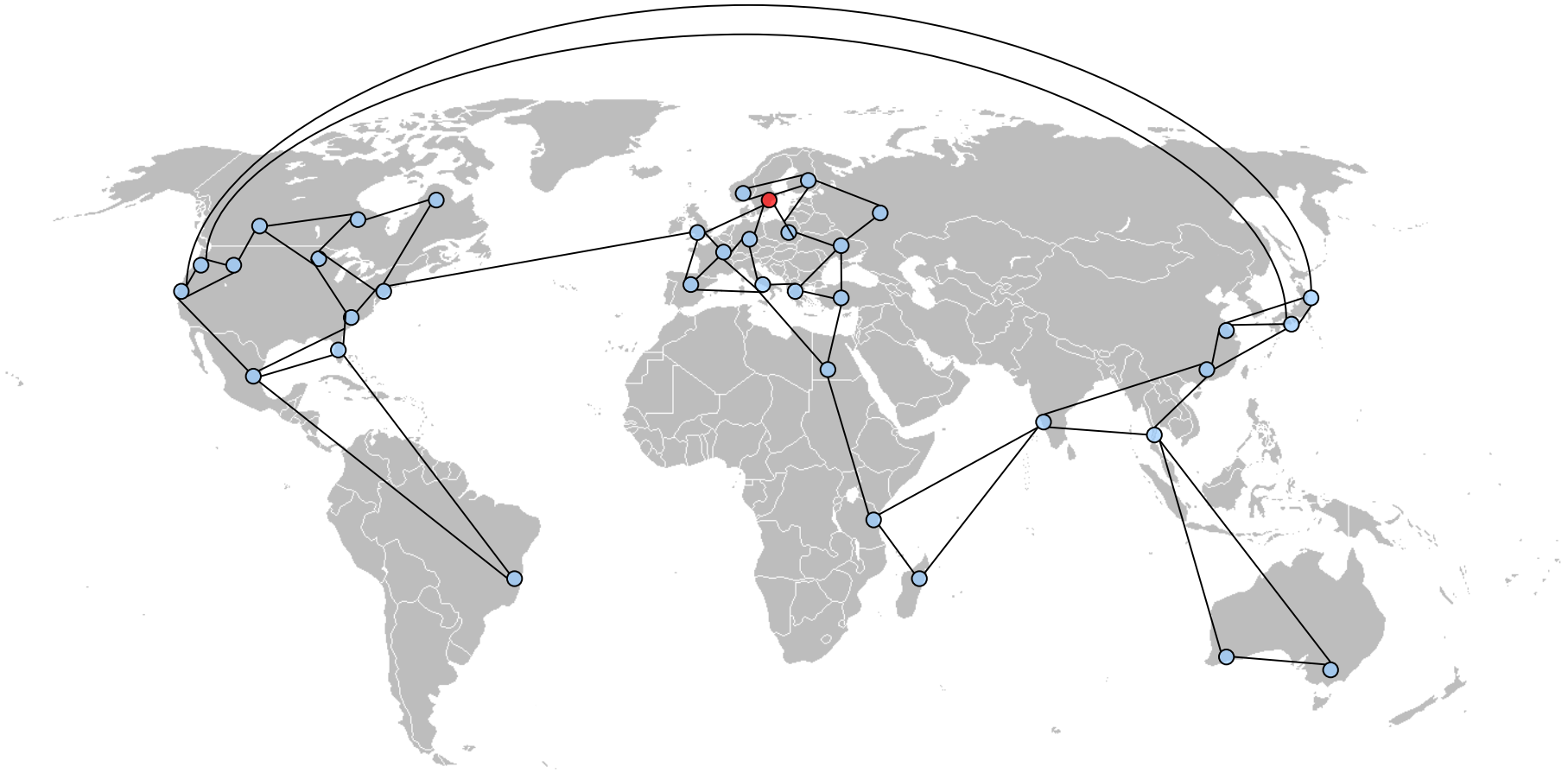
Issues

- Centralized tracker (server)
  - ✗ Single point of failure
  - ✗ Not scalable (one tracker, many peers)
  - ✗ Not locality aware (random connections)
- Decentralized tracker (peers forming a DHT)
  - ✓ No single point of failure
  - ○ More scalable (few trackers, many peers)
  - ✗ Not locality aware (random connections)

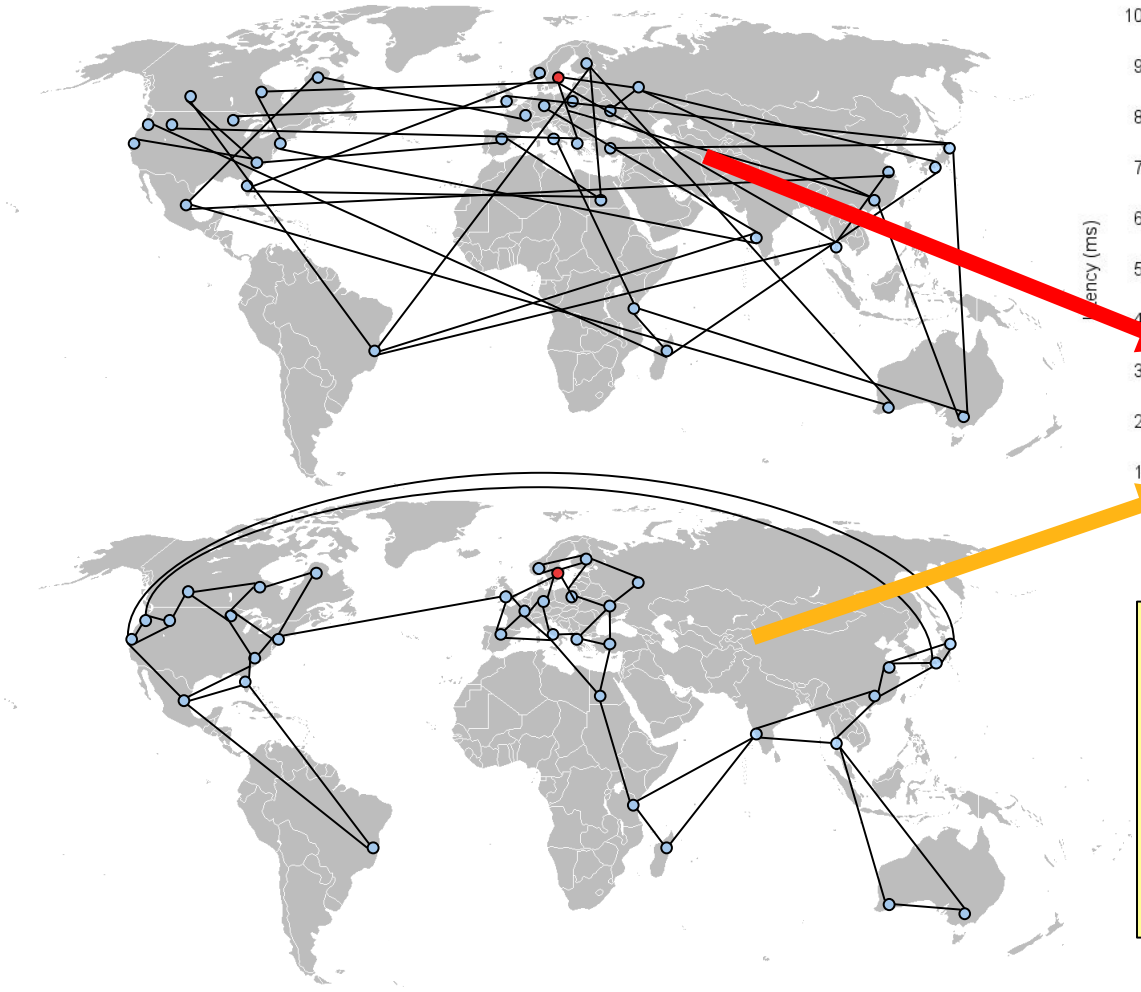
CTracker's properties

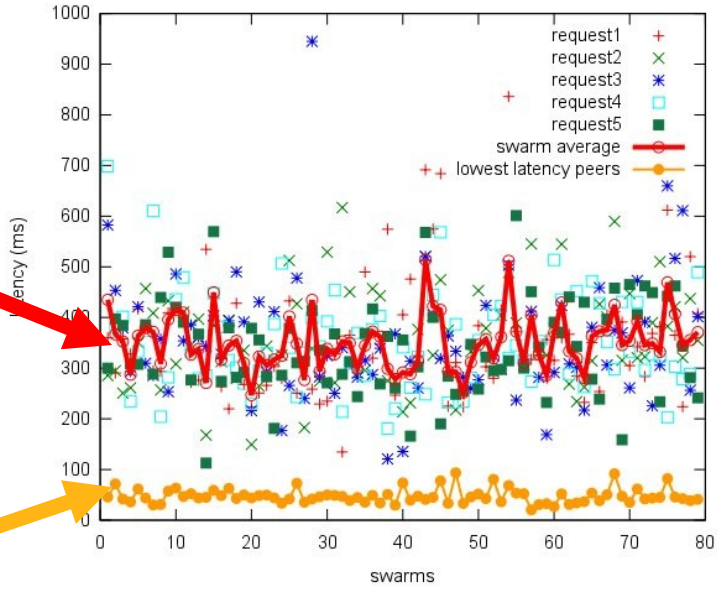
- ✓ No single point of failure
  - Distributed system (DHT)
- ✓ **Scalable**
  - Many trackers, many peers
- ✓ **Locality aware**
  - Peers connect to close peers

Locality awareness



Locality experiments (latency)

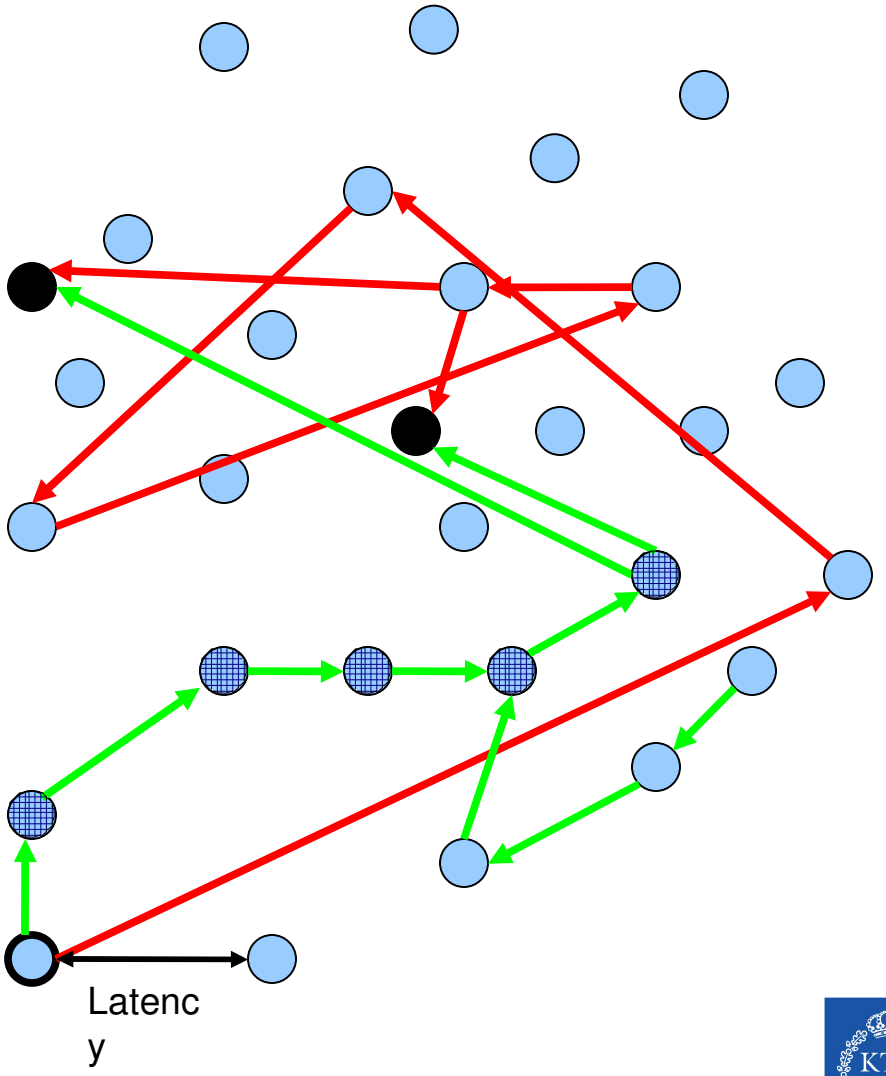




We can achieve
5-10 times
lower latency

How does CTracker achieve its properties?

- Locality awareness
  - ✗ Random latency neighbors
  - ✓ Low latency neighbors
- Scalability
  - ✗ Few trackers
  - ✓ Many “partial” trackers



Conclusion

- Current peer discovery systems
  - Limited scalability
  - Not locality aware
- CTracker
  - Address scalability and locality
- Future work
  - Integrate CTracker's properties into P2P-Next (BitTorrent)

Questions

Thank you!