

How does Centralization Start?

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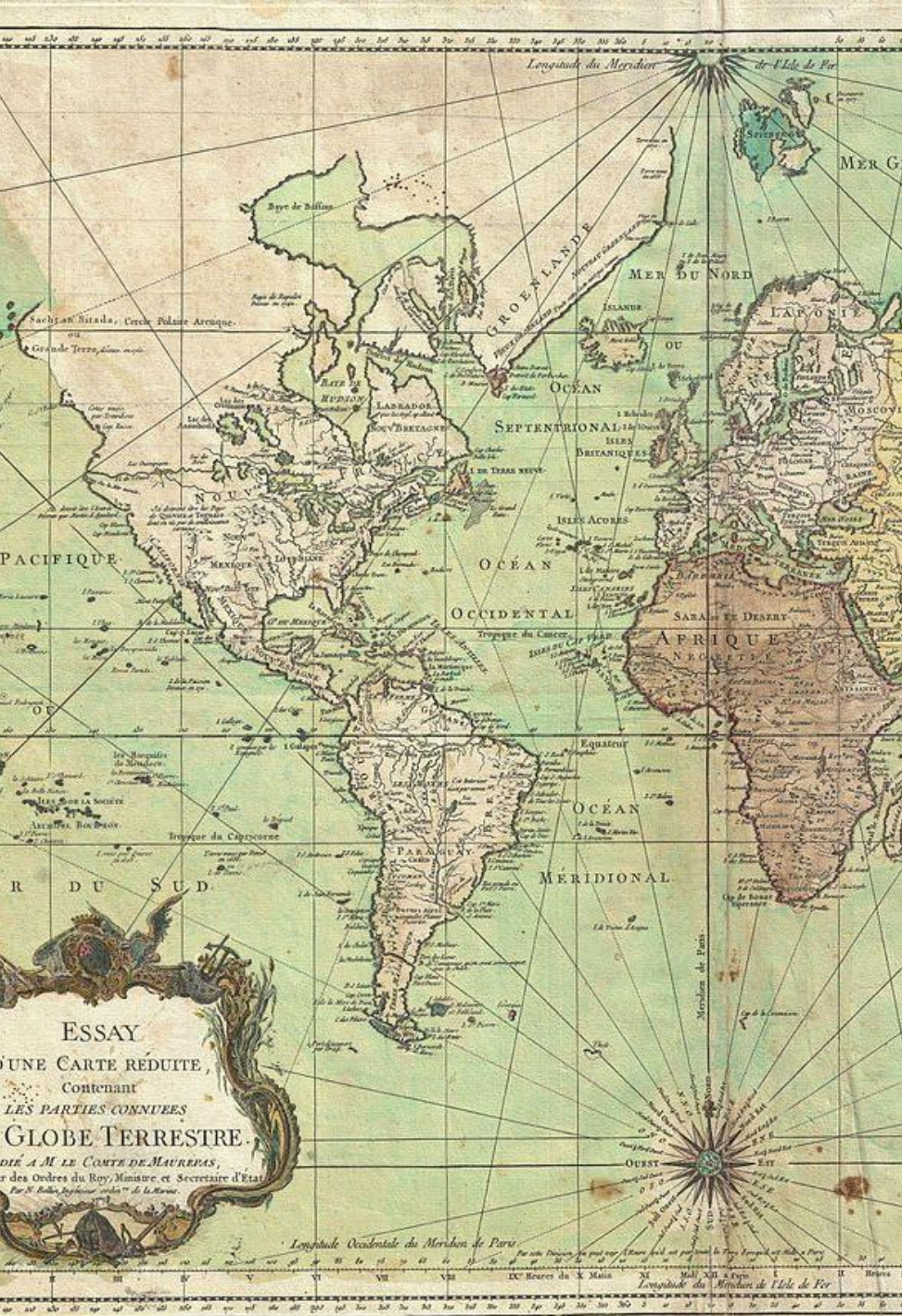
Investment starts with unsolved problems

- Distributed search
 - Altavista, Yahoo, Google (1995-2000)
- Identity, contacts, presence
 - AOL, MySpace, Facebook (2004)
- Spam, quality of email clients
 - Gmail (2004)
- DDOS
 - Cloudflare (2009)



Deal with many platforms

- Multiple OSes
 - Windows, Mac, Android, iPhone, Linux
- Multiple versions
 - New releases, countries
- Coordinated developments
 - Large team required
- Can standard clients evolve quickly?
 - Until a feature is universal?



Centralized Big Data

- More customers, more data
 - Centralized feedback
- More data, more solutions
 - Invest and fund the deployment
- More solutions, more customers
 - Coordinated deployments
- More data, less competition
 - Barrier to entry



Centralized and Free

- Make free with advertisements
 - Who can compete with free?
- Advertisements require data
 - Bigger means better data
- Better data to tune the service
 - The system knows what you want



How it ends, sometimes

- Windows Consent Decree
 - APIs published
- Market changed
 - Phones: Android and IOS
 - Laptops: Windows, Mac, Linux
 - Cloud: AWS, Azure, Google...
- Still not distributed



Decentralized Competition Seems Hard

- Some problems are political
 - Surveillance capitalism vs. Privacy
 - Acquisitions vs. Monopoly
 - Monopoly vs. APIs
- Standards take a long time
 - Identity, Spam, DDOS...
- Centralized business model is simpler
 - Address multiple platforms, evolve quickly