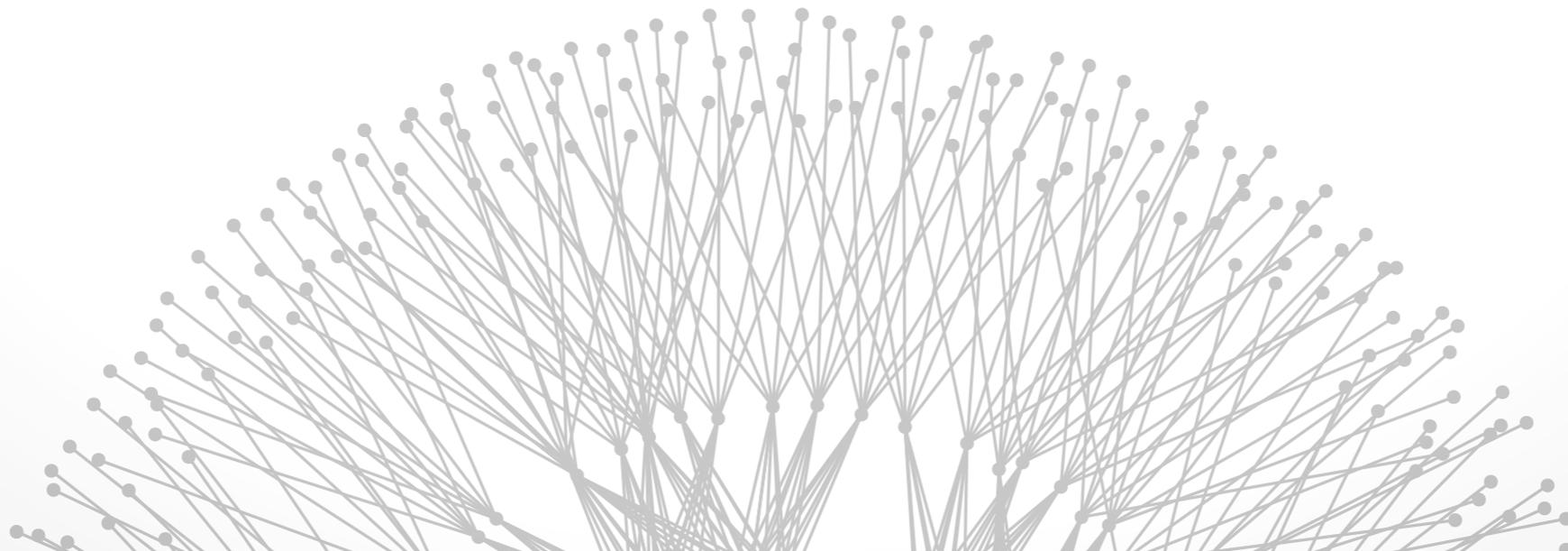


The Last Word

Brighten Godfrey
CS 538 December 10 2017



What we learned



The classics: how the networks work

The problems: how networks fail to work

The latest: how networks could work

so you now can go forth and do research...

...but why would you want to?

**Why I'm excited
about networking**

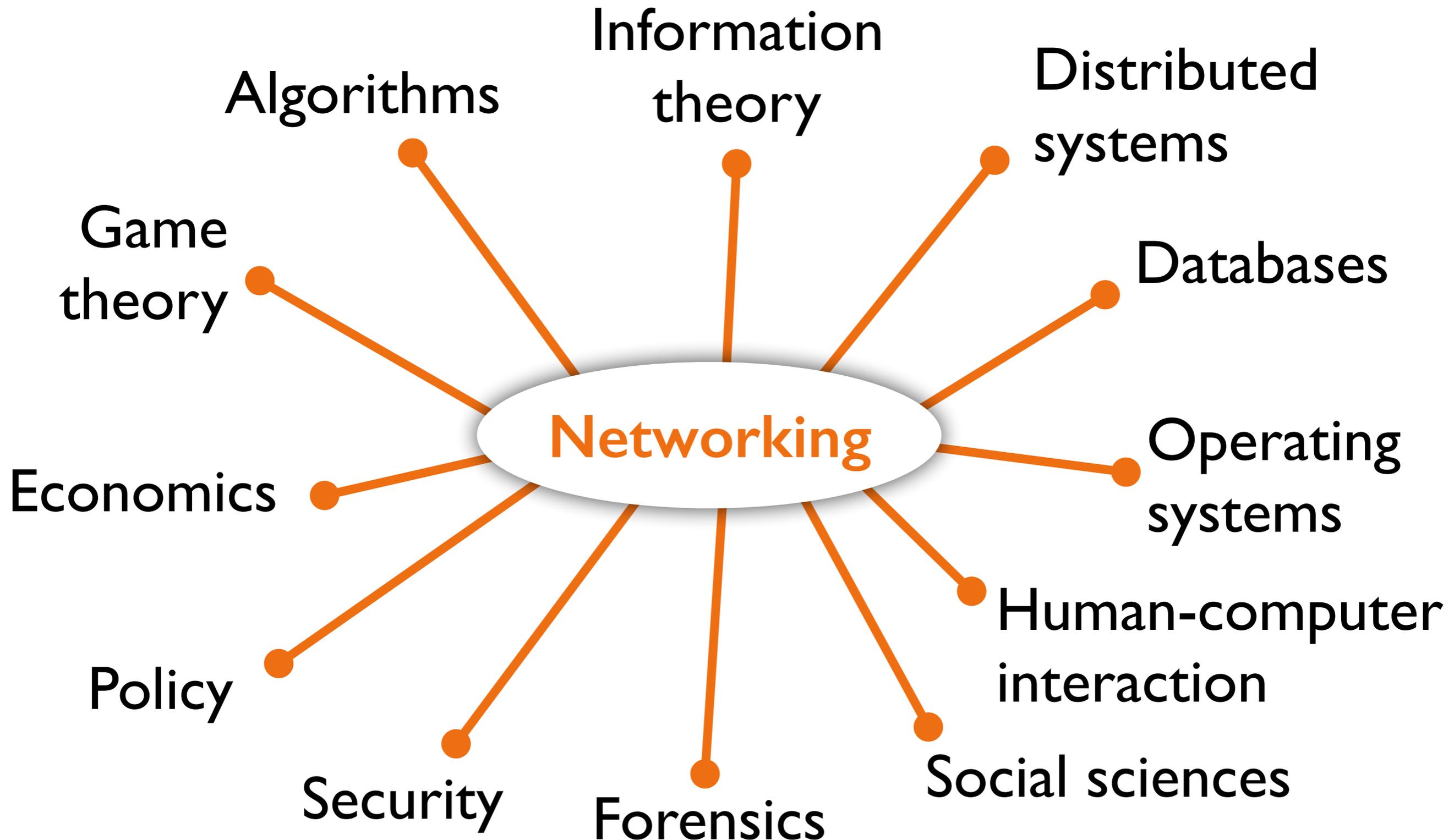
1. It's relevant



Majority of new developments in computer systems are dependent on networking

Far-reaching impacts beyond systems & networking

1. It's relevant



2. It's new



~40 years since the birth of the field

But only ~15 years since networks in widespread use

- tussles between businesses, P2P, malware, DDoS, government Internet censorship, CDNs all fundamental but relatively new!

Operating systems: ~30 years in widespread use

Physics: ~13.75 billion years in widespread use

3. It's changing



Network new people, new technologies, connect disciplines, “make order out of chaos” (– Jen Rexford)

Start a new area!

- In the last decade: Internet architecture, data centers, cloud, energy, big data, next-gen cell networks, software-defined networking, NFV, IoT, containers...
- A new subfield almost every year!

You can change not just the technology, but the field!

αλ' οὐκ ἔστιν ἡμεῖς

3. It's changing



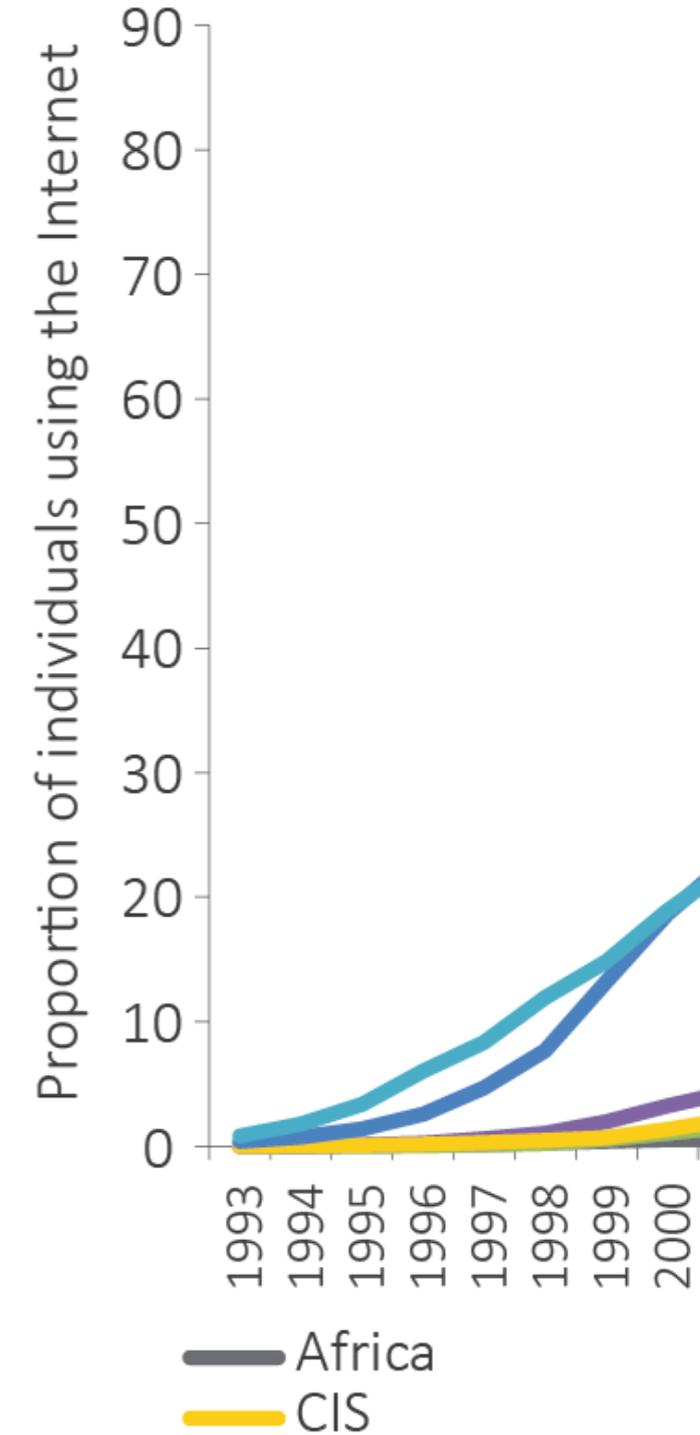
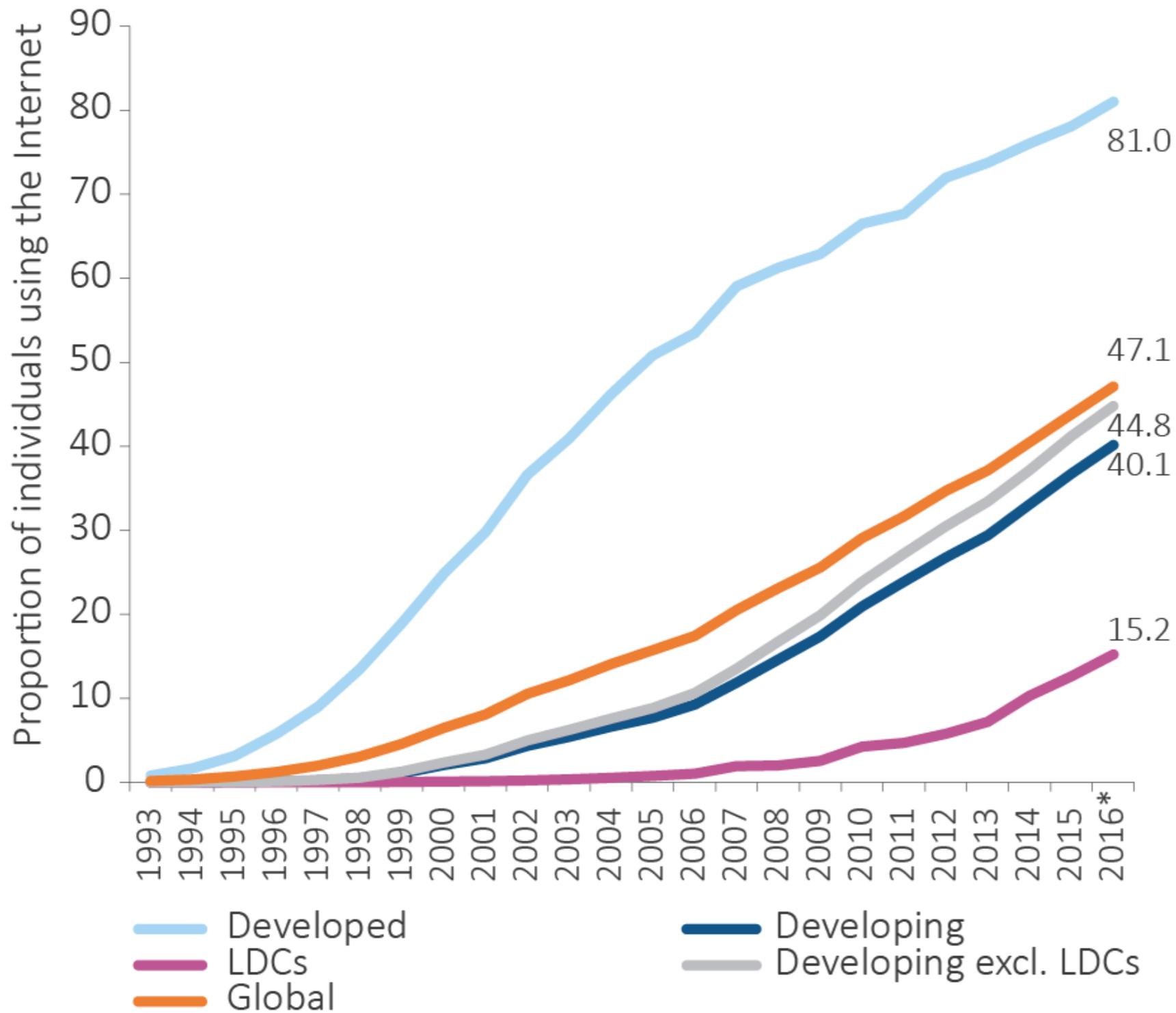
Over half the world not yet online!

It is anticipated that the whole of the populous parts of the United States will, within two or three years, be covered with network like a spider's web.

— *The London Anecdotes,*
1848



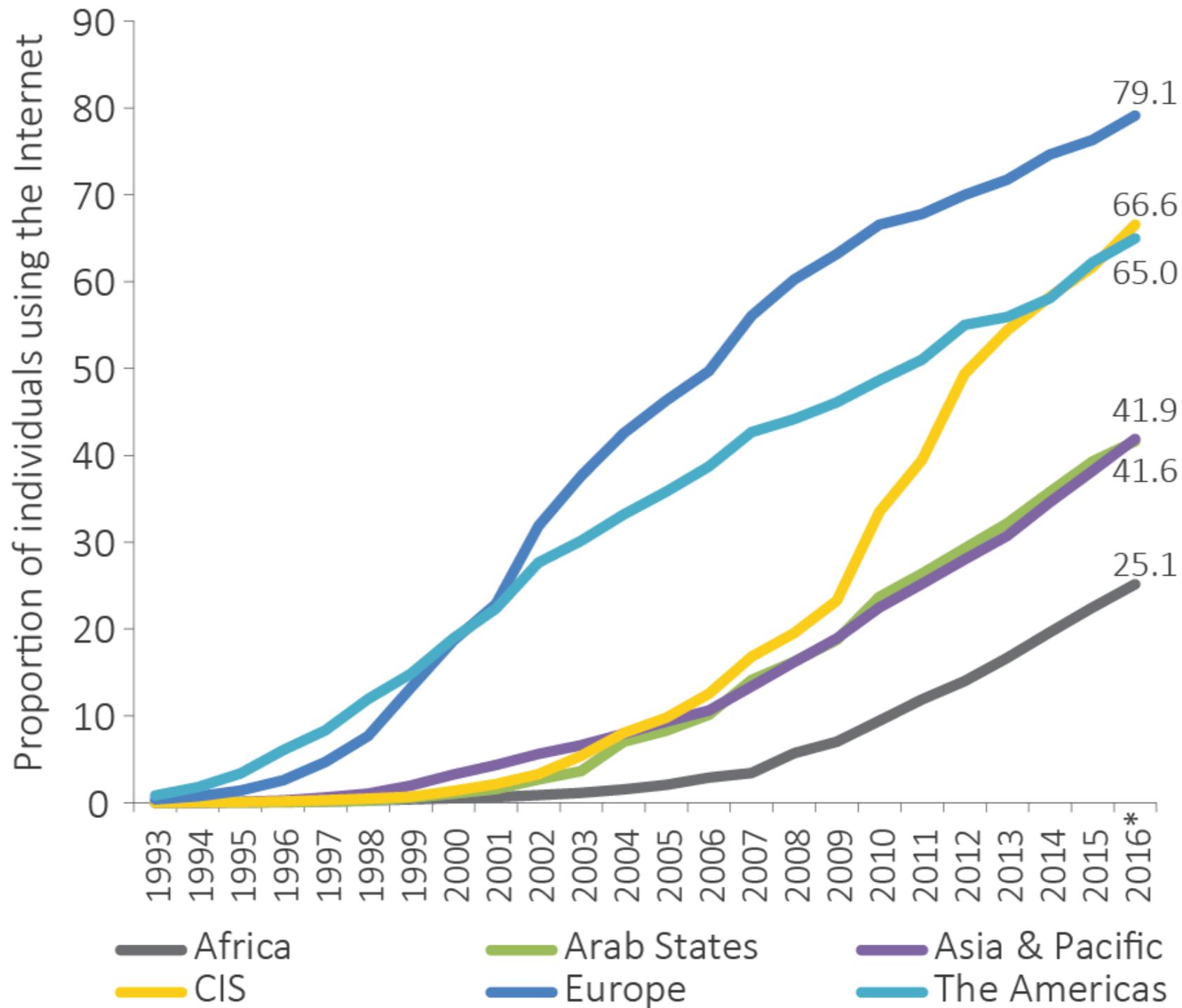
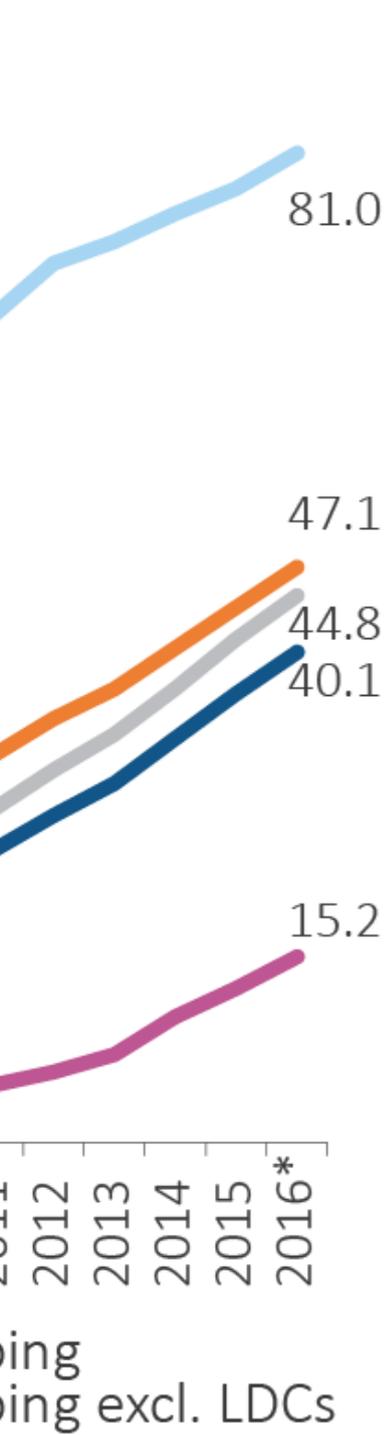
3. It's changing



Note: * Estimate.
Source: ITU.

LDCs = Least Developed Countries
CIS = Commonwealth of Independent States

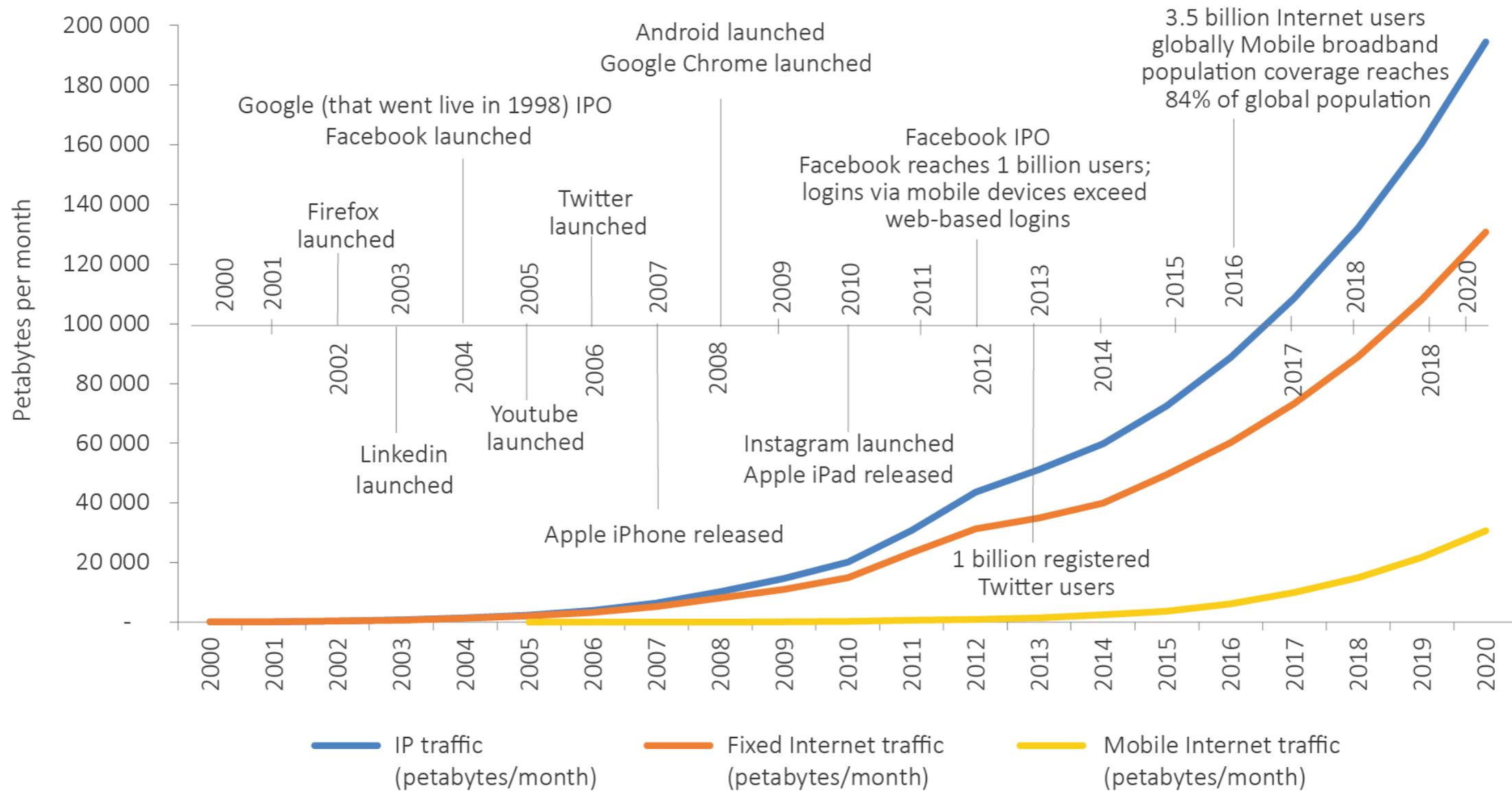
3. It's changing



LDCs = Least Developed Countries

CIS = Commonwealth of Independent States

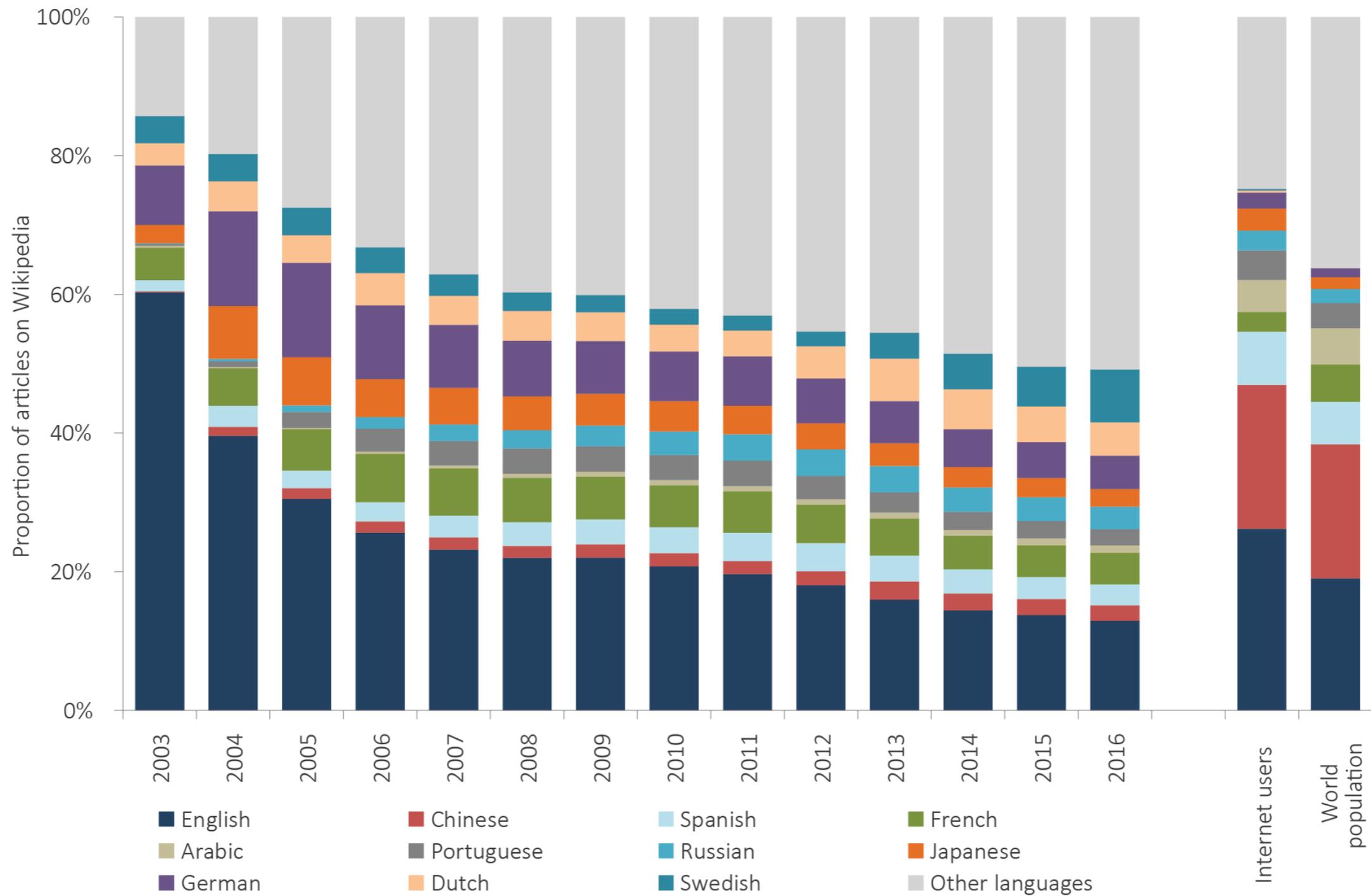
3. It's changing



Note: Fixed Internet traffic refers to traffic through fixed network providers on different platforms. Mobile Internet traffic refers to traffic through mobile-cellular networks. IP traffic refers to the sum of fixed and mobile Internet traffic (denoting all IP traffic crossing an Internet backbone) as well as non-Internet IP traffic (e.g. IP WAN, IP transport of TV and video-on-demand).

Source: ITU based on Cisco and company reports.

3. It's changing



Note: The Internet users by language data are from Internet World Statistics, which assigns a single language to each individual in order to add up to the total world population; however, it is unclear how it assigns people's first language in countries where large proportions of the population are bilingual or multilingual.

Source: Wikipedia statistics at <http://stats.wikimedia.org/EN/TablesArticlesTotal.htm>, accessed 26 May 2016, and Internet World Statistics.

3. It's changing



Over half of the world not yet online!

Innovation more possible now than ever

- Clouds
- Global-scale testbeds
- Software-defined networking
- Programmable hardware

What it all adds up to...



You have the opportunity
for big impact!

for big impact!

What's next

Final Project Extravaganza



Presentations: Tue May 9, 11am - 2pm

- Room 3403 SC
- Pizza served

Content

- What problem are you solving?
- Why has past work not addressed the problem?
- What is your approach for solving it?
- What are the key metrics for evaluation to answer the question of whether your design works?
- What are the experimental results that provide answers?
- What are the unanswered questions?

Final Project Extravaganza



“Pecha Kucha” format

- 20 slides x 20 seconds
- Automatic transitions slide-to-slide
- Optional alternate: 6 min 40 sec freeform talk

Your group should send me one email:

- Slide deck
- Presentation format
- Send by 11:59 pm Monday May 8

Thank you!

One more thing...



ICES forms!