

# Internet for All

Pre-course meeting for Winter Term 2021/22

Prof. Dr.-Ing. Jörg Ott

Pegah Torkamandi

Trinh Viet Doan

Chair of Connected Mobility

July 13, 2021



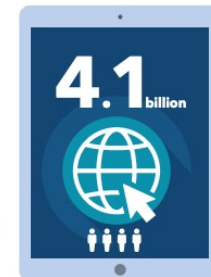
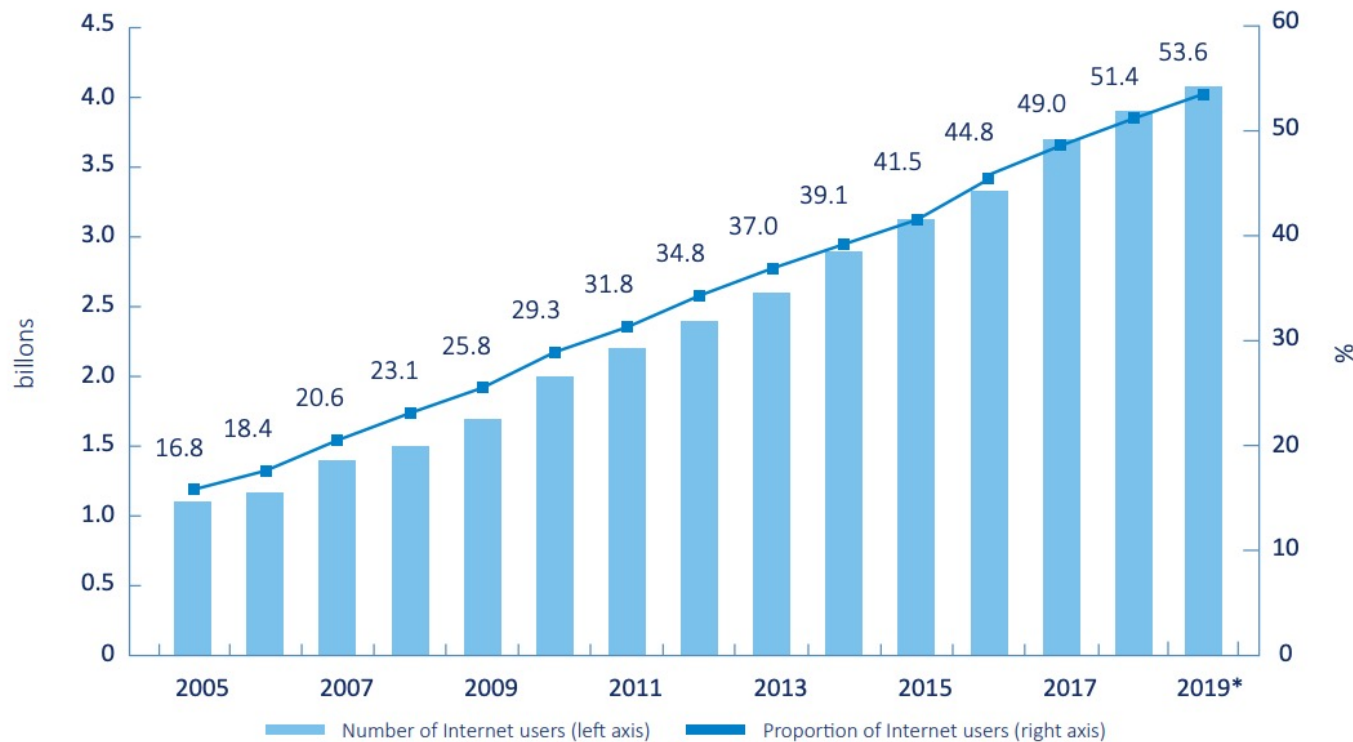
# Sharing & Communication Through The Ages



- Cave Paintings**  
France, 30,000 BC  
Who doesn't love a cave painting? Created to communicate, themes included animals and symbols for early man.
- Pictograms**  
China & Egypt, 5000 BC  
Pictograms and ideograms represented a concept, object or activity, and led to Egyptian hieroglyphs and Chinese characters.
- Carrier Pigeons**  
Greece, 776 BC  
OK, pigeons are disease-ridden, but they're great with directions, and rather load bearing, according to the Ancient Greeks.
- First Postal Service**  
Persia, 550 BC  
Persian King Cyrus the Great created the first Postal Service – which handily doubled as data and tax gathering as well.
- The Marathon Man**  
Greece, 530 BC  
Ancient Greek Pheidippides ran 150 miles in two days (with no trainers!) to announce the Greek victory over Persia.
- Heliographs**  
Rome, 37 AD  
Roman Emperor Tiberius sent coded orders daily by heliograph to the mainland from his island, Capri. Alright for some!
- Paper**  
China, 105 AD  
Tsai Lun of China took the inner bark of a mulberry tree, added water, pounded it a lot – and voila, paper was invented!
- Town Crier/Bellman**  
The UK, 1540 AD  
What did Town Criers tell the illiterate masses? Royal proclamations, local bylaws and – of course – local business adverts.
- Daily Newspaper**  
Germany, 1650 AD  
The first daily was the 'Einkommende Zeitung' published in Leipzig, 1650. The first English daily was the daily Courant, 1702.
- Morse Code**  
The USA, 1835 AD  
American Samuel Morse invents Morse code, a series of on/off clicks, tones or lights. Great (and disastrous) for the navy!
- Telephone**  
The USA, 1876 AD  
Scottish engineer Alexander Graham Bell patents the electric telephone. No camera or apps, but exciting nonetheless!
- First Transatlantic Signal**  
Cornwall to Newfoundland, 1902 AD  
Italian inventor Guglielmo Marconi transmits the first radio signal to travel the Atlantic Ocean.
- 1st TV Broadcast**  
Great Britain, 1927 AD  
Scottish inventor John Logie Baird transmitted the first television signal. Finally, something to point our sofas towards!
- ARPANET Launched**  
The USA, 1969 AD  
The Advanced Research Projects Agency Network was the precursor network to what we now know as the global Internet.
- WWW**  
USA, 1994 AD  
American government releases control of the Internet and the world wide web is born – hello light speed news and online shopping!
- AIM**  
USA, 1997 AD  
AOL pioneered Internet chat with AIM (AOL Instant Messenger) in 1997. Now we could all safely talk to total strangers!
- Blogging**  
USA, 1999 AD  
Everyone gets a voice – the launch of Blogger.com and LiveJournal in 1999 led to a blogging explosion across the Internet.
- Facebook**  
USA, 2004 AD  
Bored Harvard student Mark Zuckerberg created Facebook. Today it has an estimated 850 million users. Like?
- YouTube**  
USA, 2005 AD  
YouTube broke ground in user-generated content, with users uploading videos across the Internet. Totally viral, right?
- Twitter**  
USA, 2006 AD  
What can you really say in 140 characters? A lot, according to Twitter's 350m+ users – it's a micro-blogging masterclass.

## Internet usage keeps growing, but barriers lie ahead

*Individuals using the Internet, 2005-2019\**



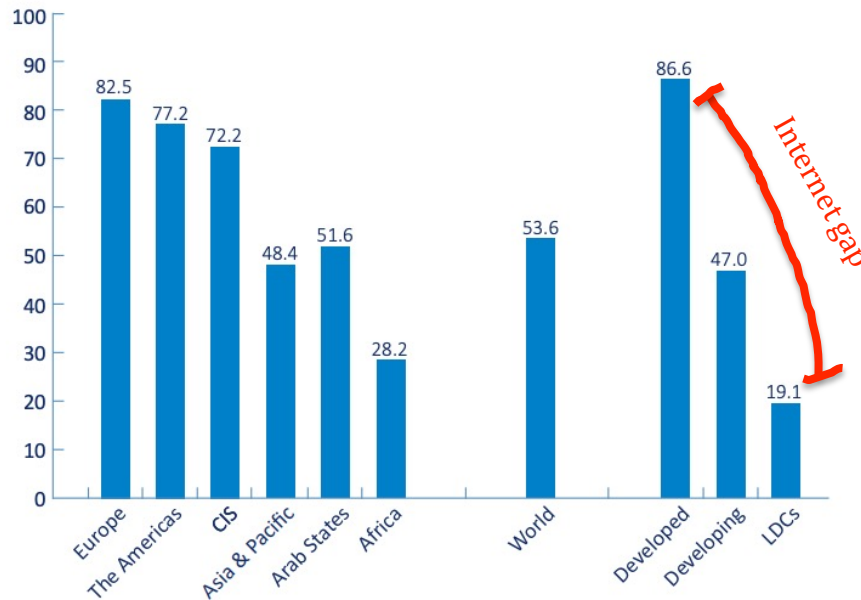
An estimated 4.1 billion people are using the Internet in 2019, reflecting a 5.3 per cent increase compared with 2018.



Between 2005 and 2019, the number of Internet users grew on average by 10 per cent every year.

Note: \* ITU estimate. Source: ITU.

*Percentage of individuals using the Internet, by region and development status, 2019\**

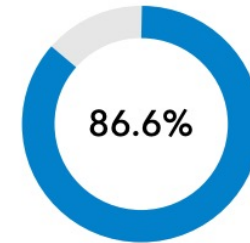


Note: \* ITU estimate. Source: ITU.

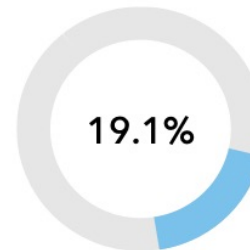
In developed countries, most people are online, with close to 87 per cent of individuals using the Internet.

In the least developed countries (LDCs), on the other hand, only 19 per cent of individuals are online in 2019.

Europe is the region with the highest Internet usage rates, Africa the region with the lowest Internet usage rates.



Developed Countries



LDCs

Most of the offline population lives in least developed countries!

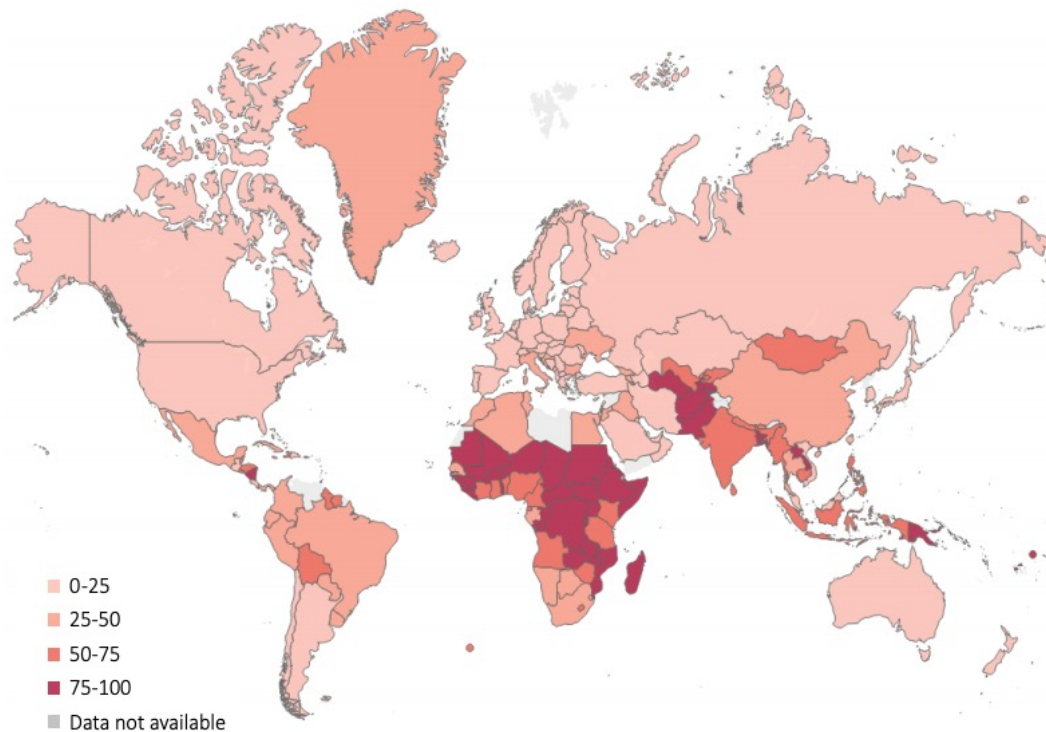


Africa

Europe



## Percentage of the population not using the Internet, 2019\*



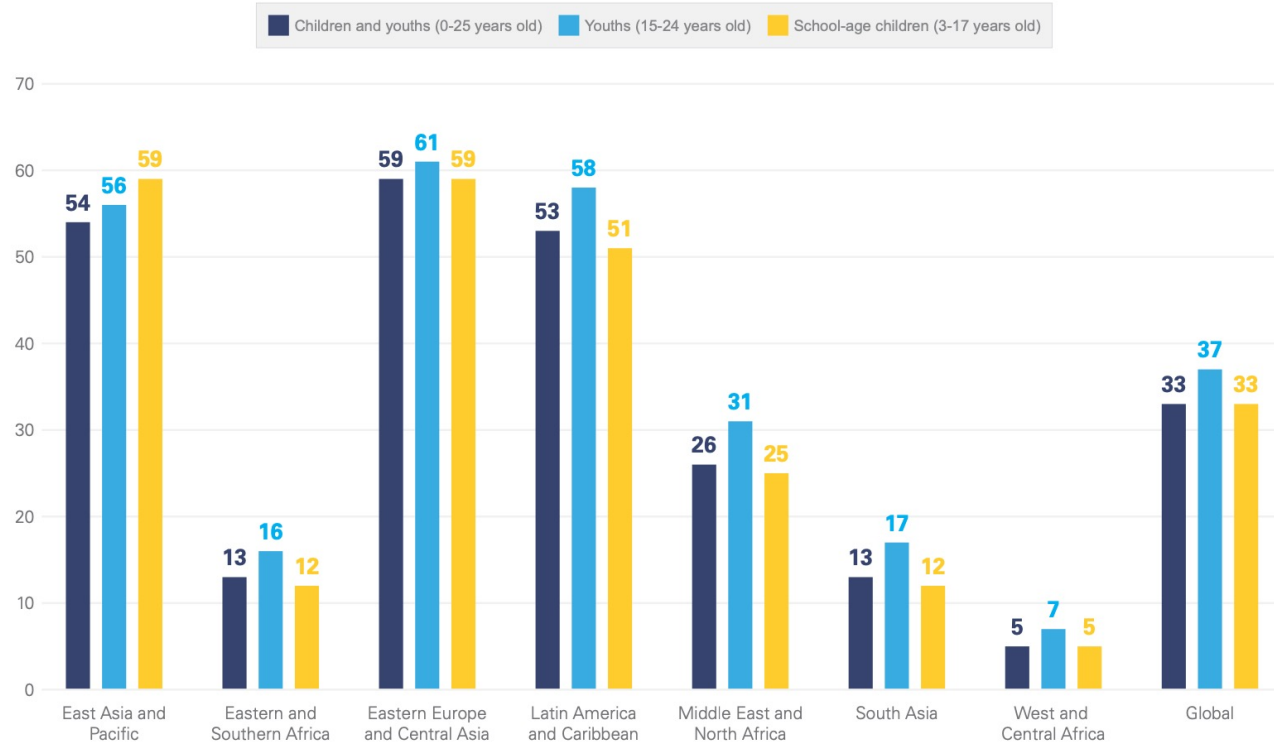
The map of the offline population highlights regional differences in Internet usage.

Countries with the highest proportions of people not using the Internet are mostly in Africa and South Asia, although there are inter-regional differences.

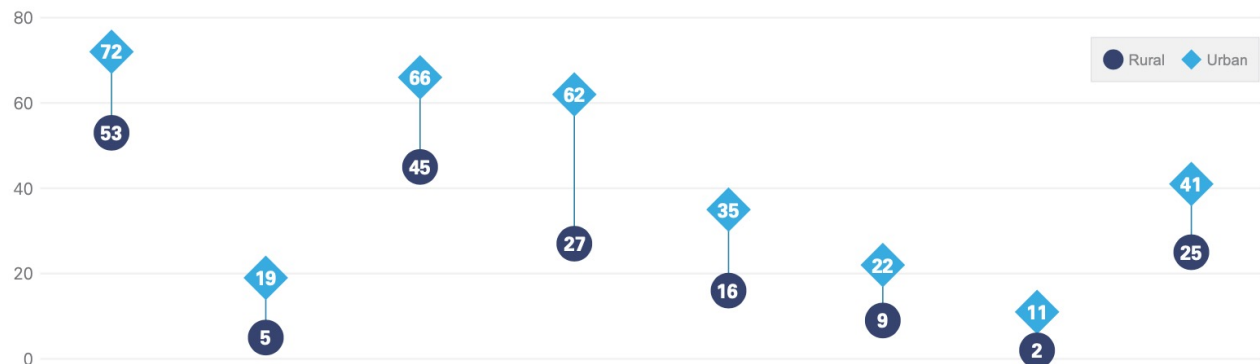


Note: \* ITU estimate. Source: ITU.

## Percentage of children and young people with internet access at home, by region



## Percentage of children and young people aged 25 years or less with internet access at home, by place of residence



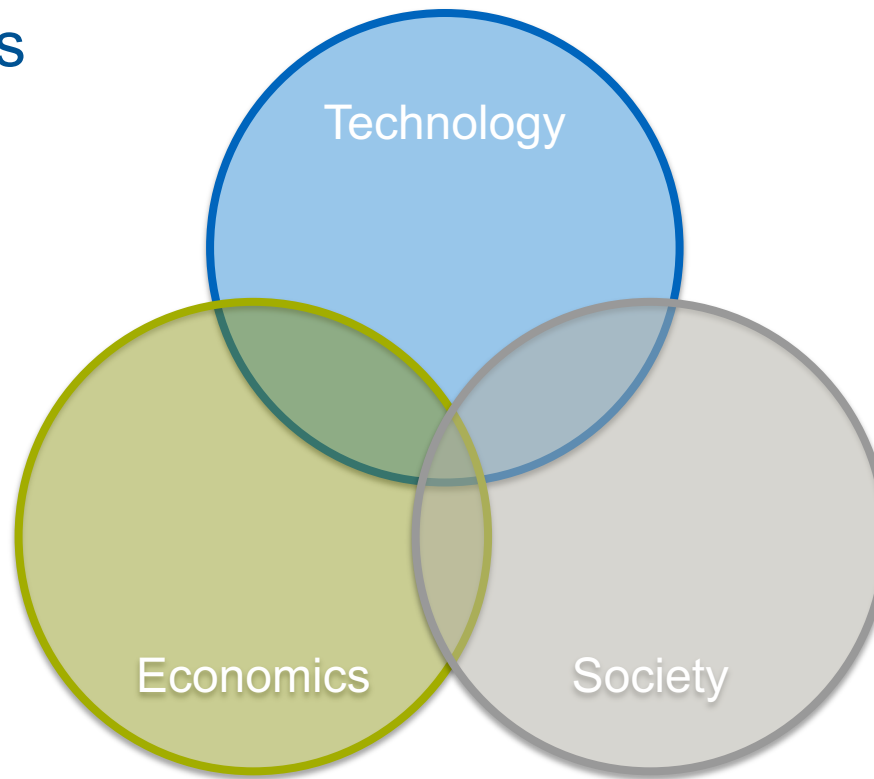
**2.2 billion** – or **2 in 3**  
children and young people  
aged 25 years or less – do not  
have internet access at home

What causes the gap?

How can we bridge the gap?

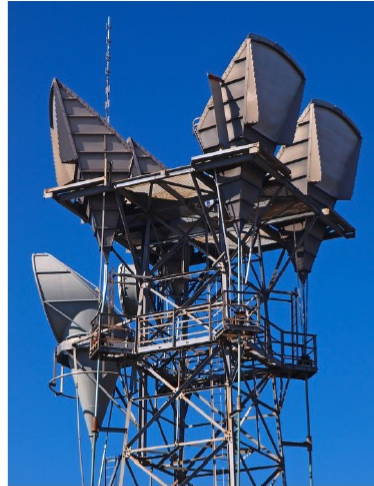
Challenges

Solutions

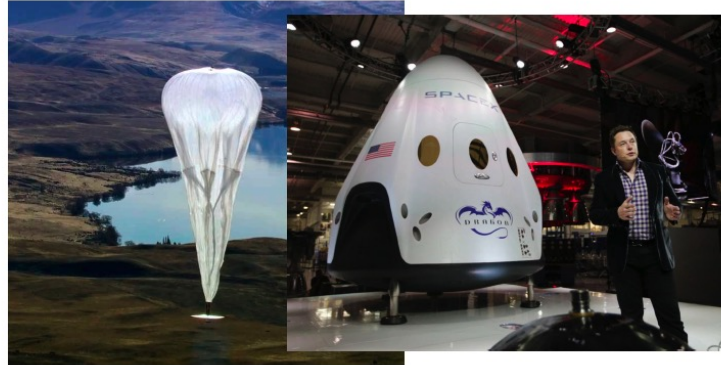




# Meta Theme: Infrastructure



# Solutions



## MONSTER PROJECTS

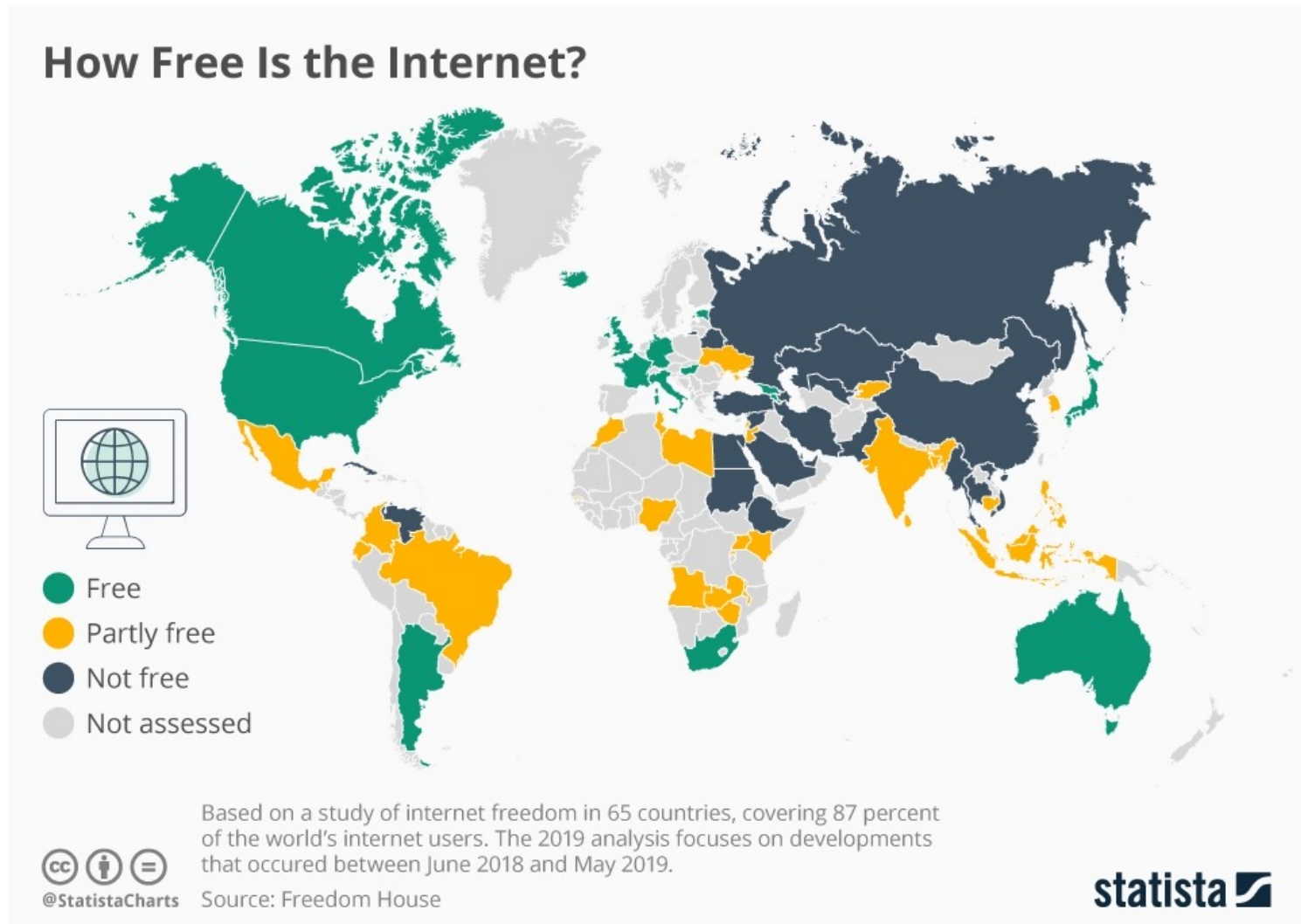
## COMMUNITY NETWORKS



## INNOVATIVE ISPs



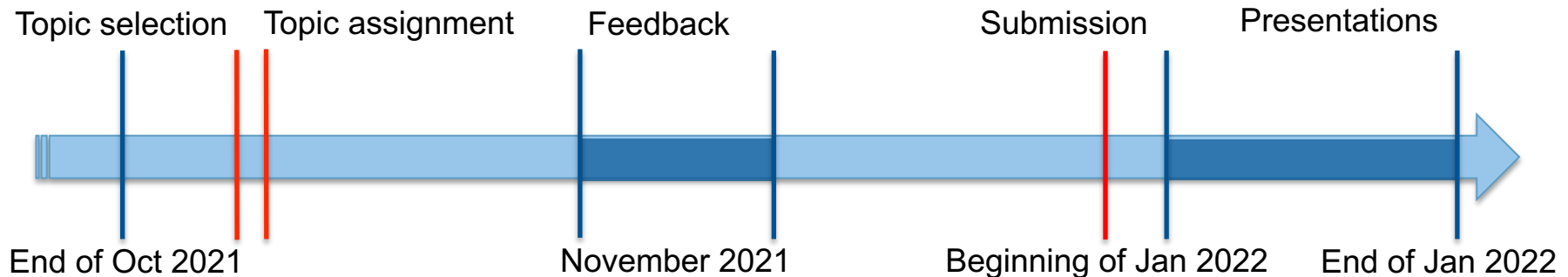
# Meta Theme: Censorship



# Organization



# Seminar Outline & Expectations



- **Choice**
  - Pick topic: 3 topics in order of preference email to course admins
  - Topic assignment: via mail and in Moodle
  - Opponent assignment: at the same time
- **Preparation**
  - Skim the papers and pick 3 – 4 for inclusion
  - Find additional resources (1 – 2 papers) from past few years
  - Check for relevant (recent) news articles, blogs, or datasets
  - Synthesize your findings

# Seminar Outline & Expectations (2)

- **Feedback round**
  - Short presentation on your material and the line of synthesis
  - Pick a unique time slot on a Doodle poll
- **Final**
  - Write-up: 6 – 8 pages double column format (10pt)
  - Deadline: Beginning of January 2022
  - We will forward this to your “opponent”
  - Presentation with slides: 30min (max, incl. Q&A)
  - Participation in the discussion
  - Read one other student’s paper and prepare questions
  - Presentations: Mid–End of January 2022




# Topics

# Topics

1. Networking in remote areas
2. Localized networking
3. Education aspects
4. Economics and society
5. Censorship
6. Bridging the digital divide
7. Internet access on the move

# More Info

Lehrstuhl für Connected Mobility  
Fakultät für Informatik  
Technische Universität München



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Summer Term 2021

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## Master Seminar - Internet for All (WS 2021/22)

*The Internet has become an essential element of our daily lives, ranging from news and information to business to entertainment to personal routines. At least for those living in urban areas in industrialized countries. However, the majority of the world's population is still off the net. This may have different reasons (which are partly intertwined), including: 1) on the technical side, Internet connectivity being not available or of poor performance; 2) on the market side, Internet access (network connectivity, devices) being not affordable; and 3) on the political side, Internet access being limited by means of censorship.*

In this seminar, we will explore case studies from different regions about missing or poor Internet connectivity. We will explore different types of measures (of technical and non-technical nature) to improve the situation on connectivity.

Internet for All is presently a topic of many activities, one of which is the Global Access to the Internet for All (GAIA) Research Group of the Internet Research Task Force.

Lack of Internet access could be attributed to a number of reasons, including (but not limited to) the following. There may be no physical infrastructure such as fixed lines or wireless networks, (stable) electricity, devices to access the network. Reasons for this motivated by the terrain (e.g., remote regions) or the economic situation in an area, or—quite often—a combination of both; but also disasters may create loss of connectivity and/or a strong need for impromptu networks. Sufficient education is also a pre-requisite for participating in the Internet, starting with as simple aspects as literacy. Internet access might also be available but it intentionally blocked or limited as we see with many attempts of censorship, which also limits freedom of speech and hence the value the network can bring.

In our topic areas, we try to reflect the above spectrum and offer seminar topics ranging from technical solutions to measurement-based observations of the status quo to political and economics aspects.

- Wireless mesh networks for rural and urban environments
- Alternative networking concepts and local/regional networking
- Economics and ecosystems
- Many flavors and aspects of censorship
- Technology for education and technology for people with less education

<https://www.in.tum.de/cm/teaching/internet-for-all-ws2122/>