

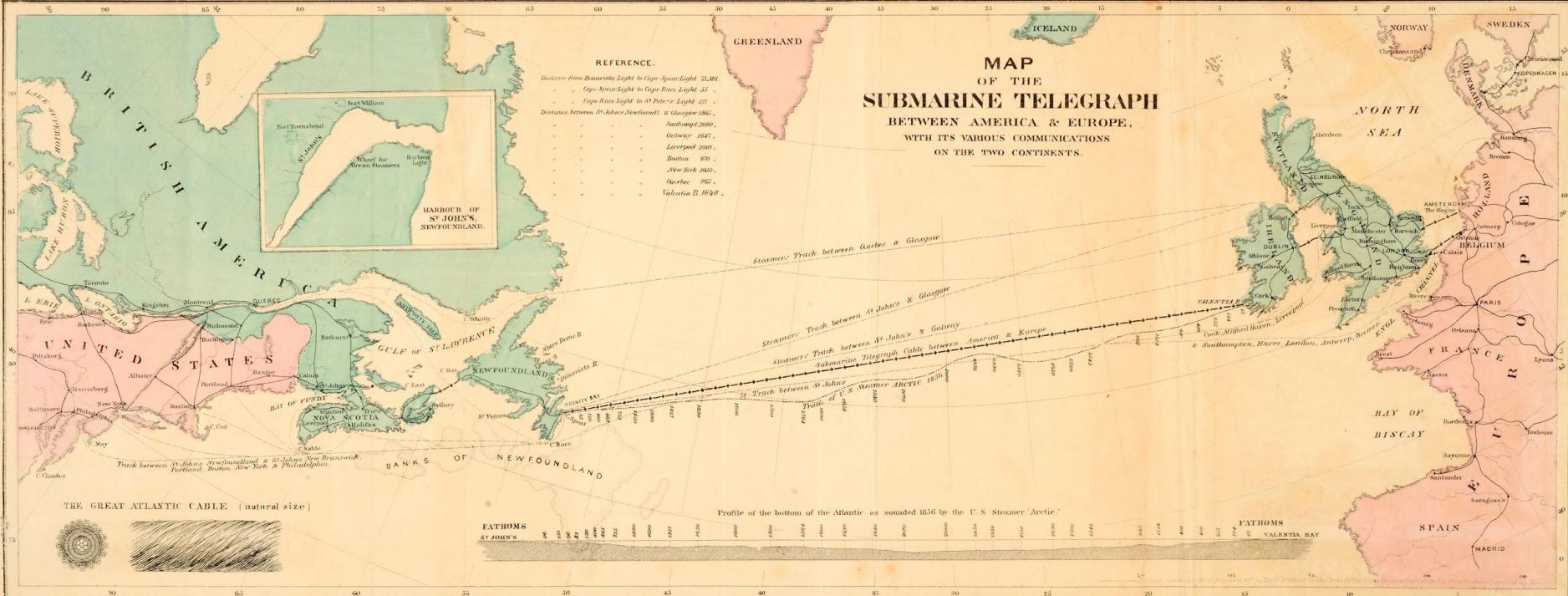
dismantling  
the master's  
infrastructures



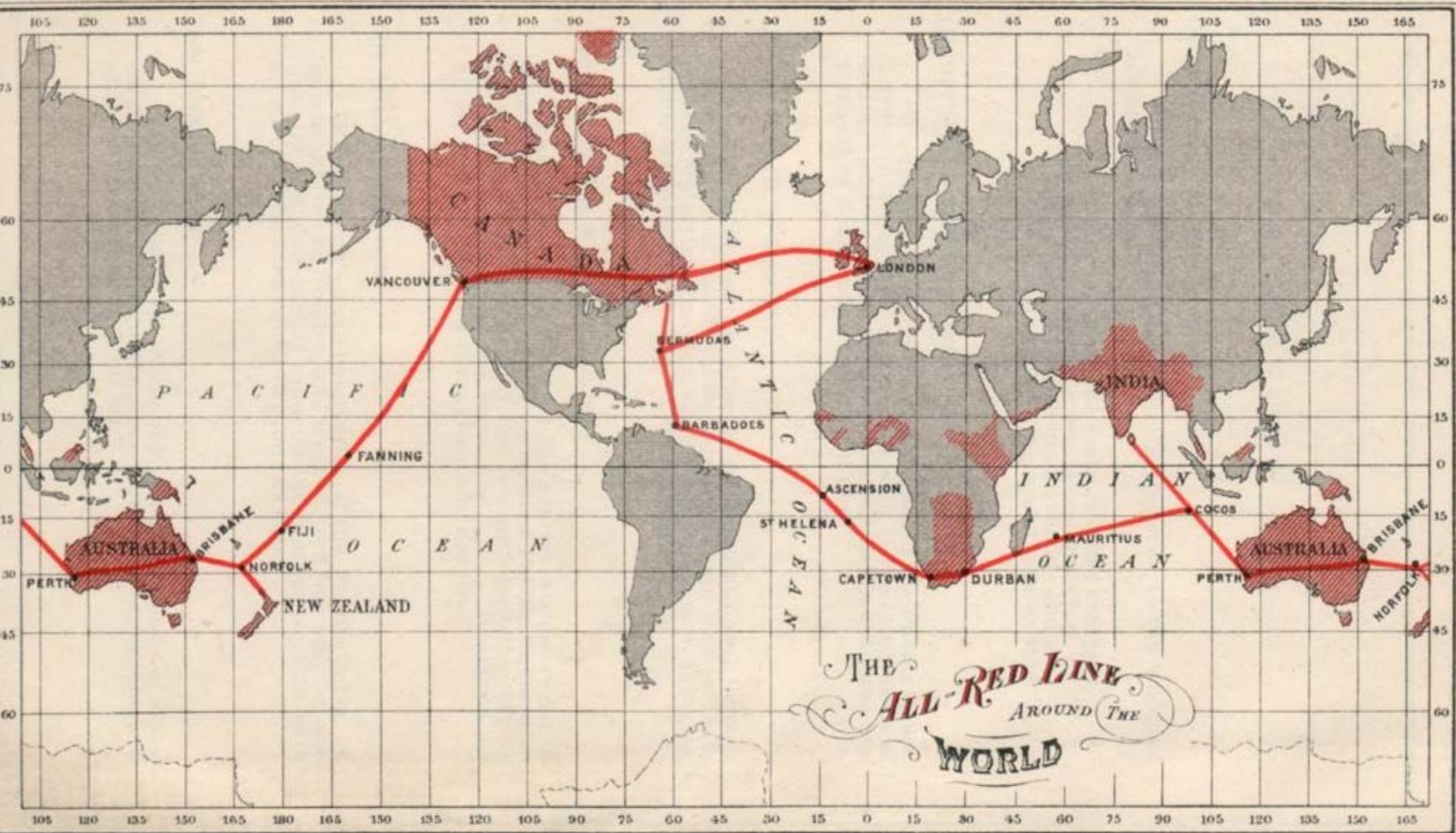
# Niels ten Oever, PhD

Postdoctoral Researcher  
University of Amsterdam  
IN-SIGHT.it

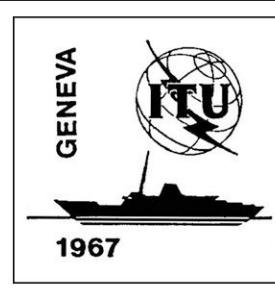
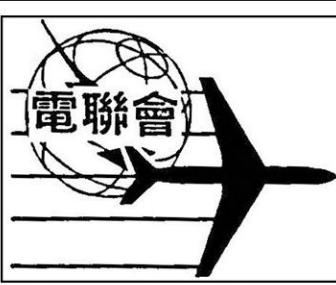
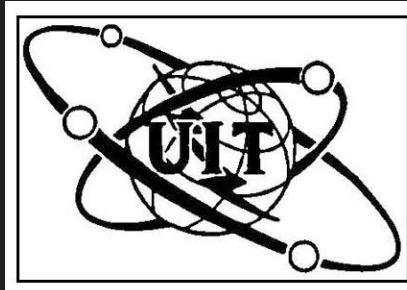
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<https://nielstenoever.net>  
[@nielstenoever](https://nielstenoever)

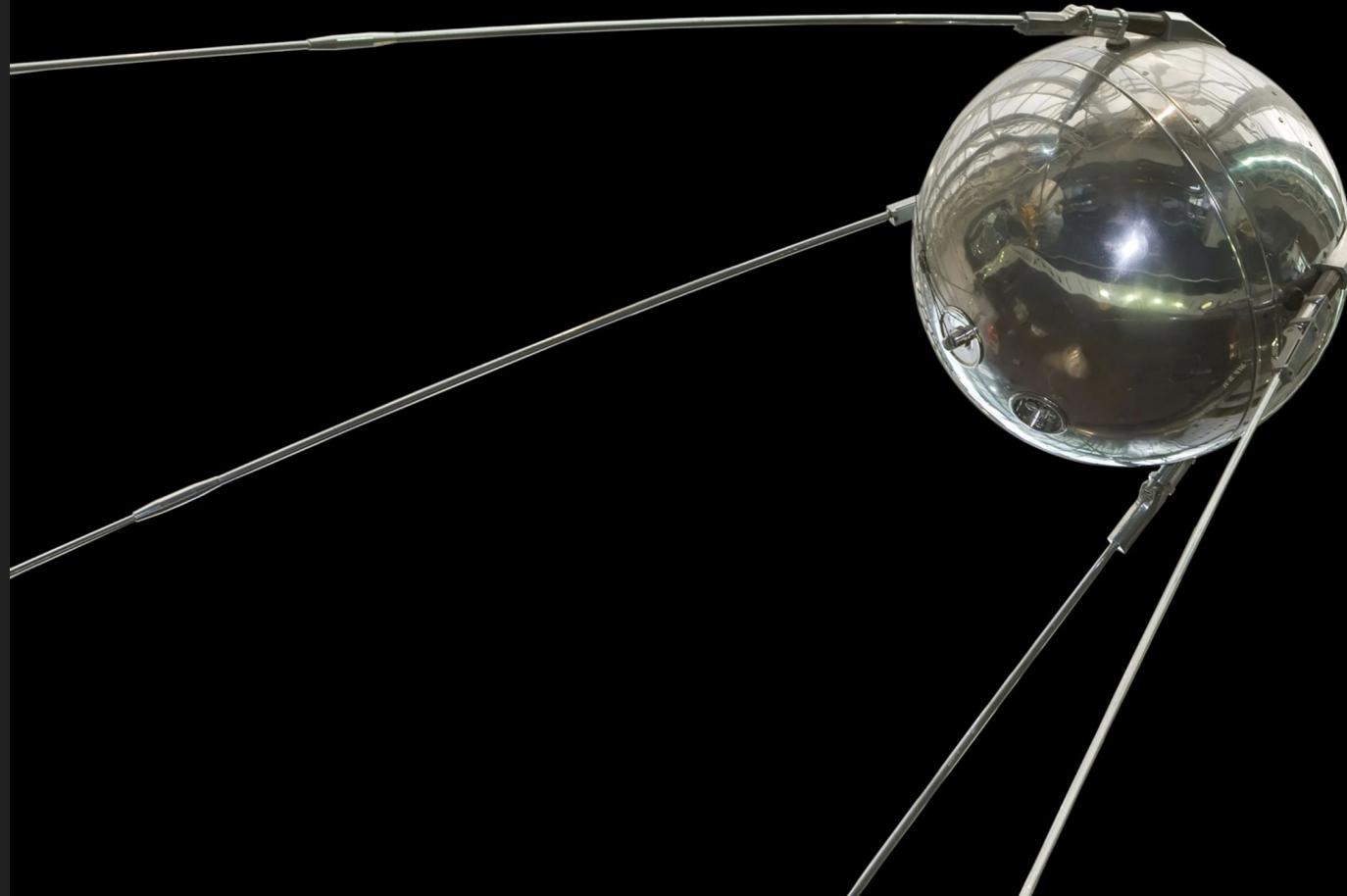


Printed for HOWES' ADVENTURES & ACHIEVEMENTS of AMERICANS.

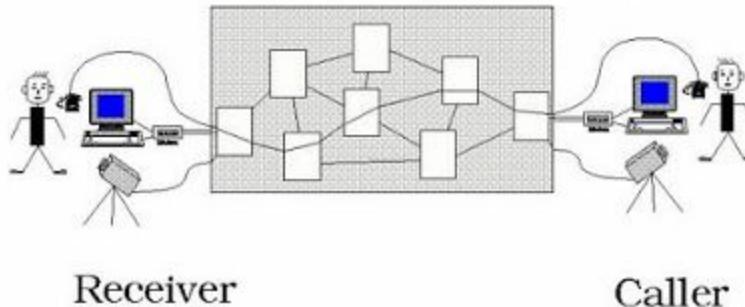




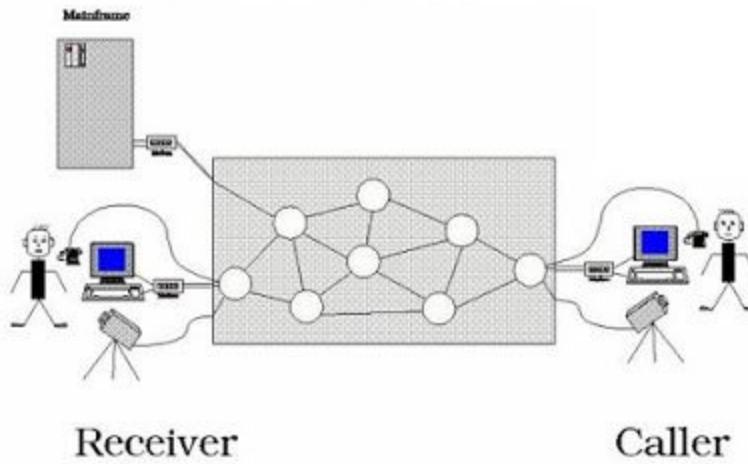




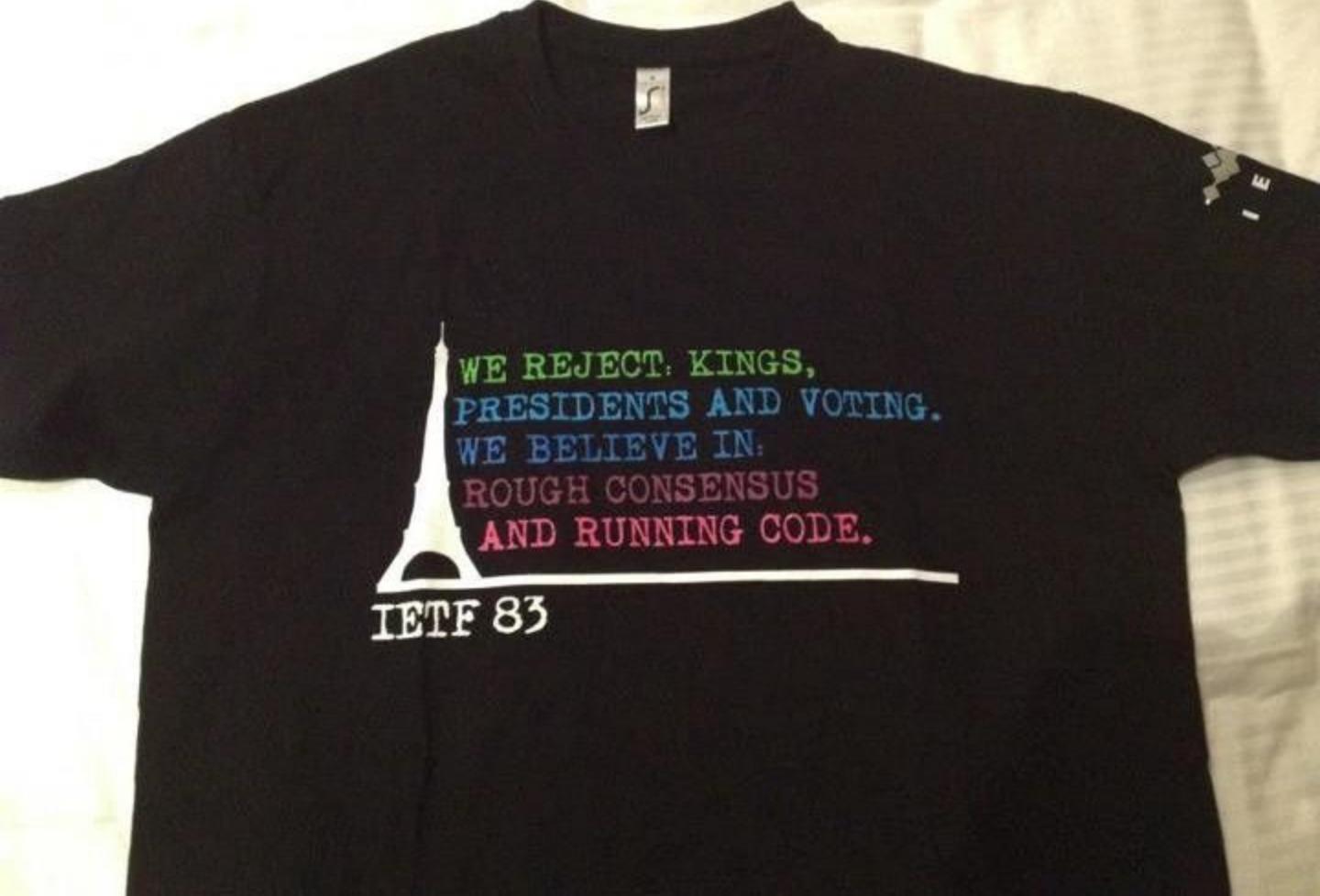
## Circuit Switched Network



## Packet Switched Network



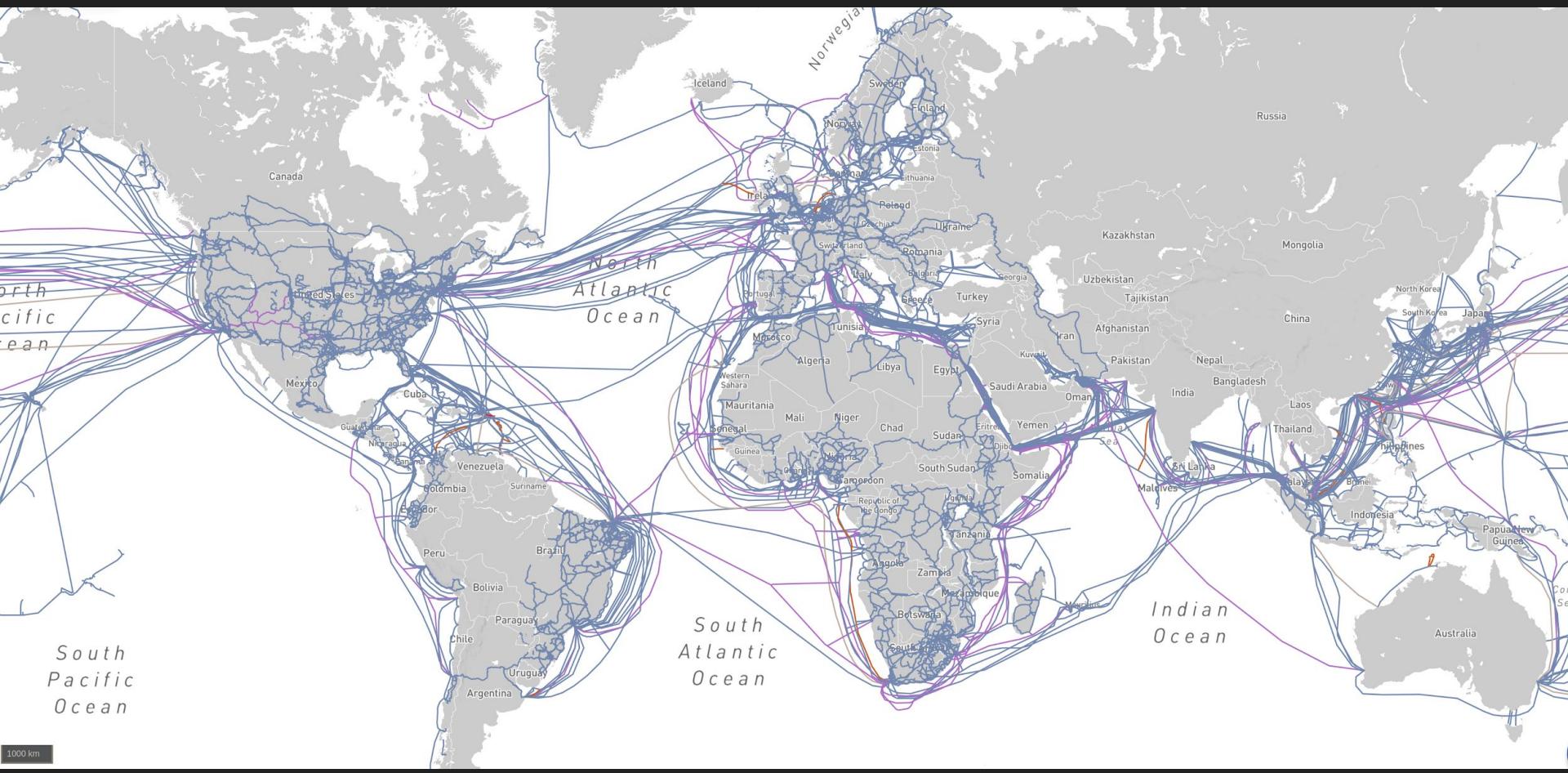




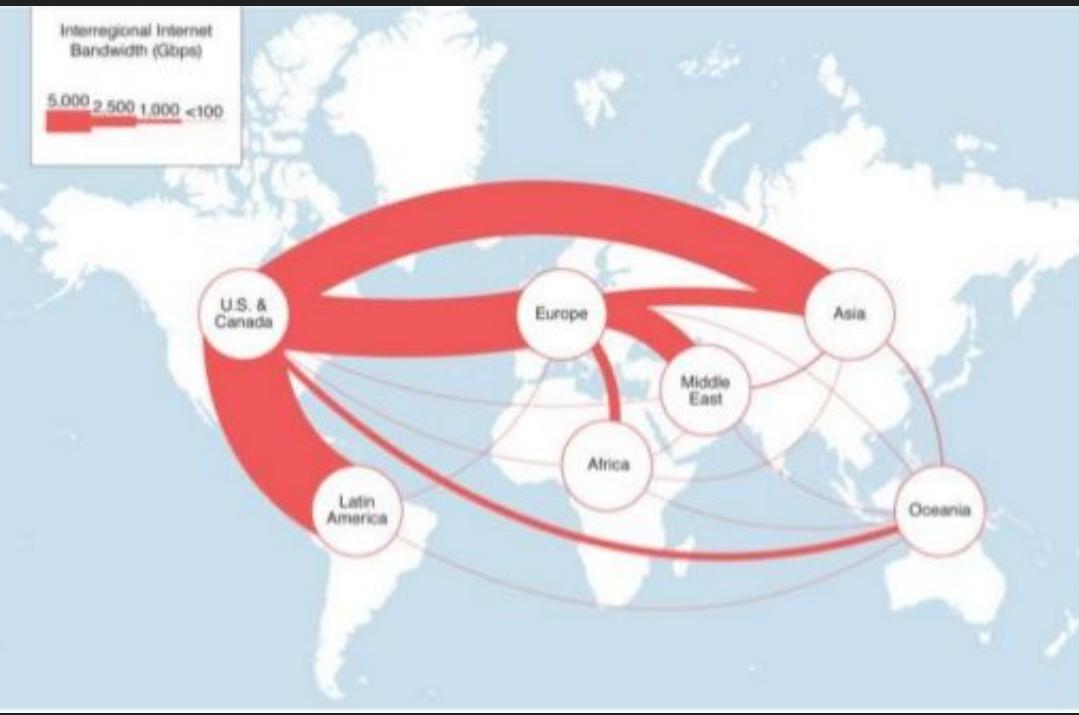
WE REJECT: KINGS,  
PRESIDENTS AND VOTING.  
WE BELIEVE IN:  
ROUGH CONSENSUS  
AND RUNNING CODE.

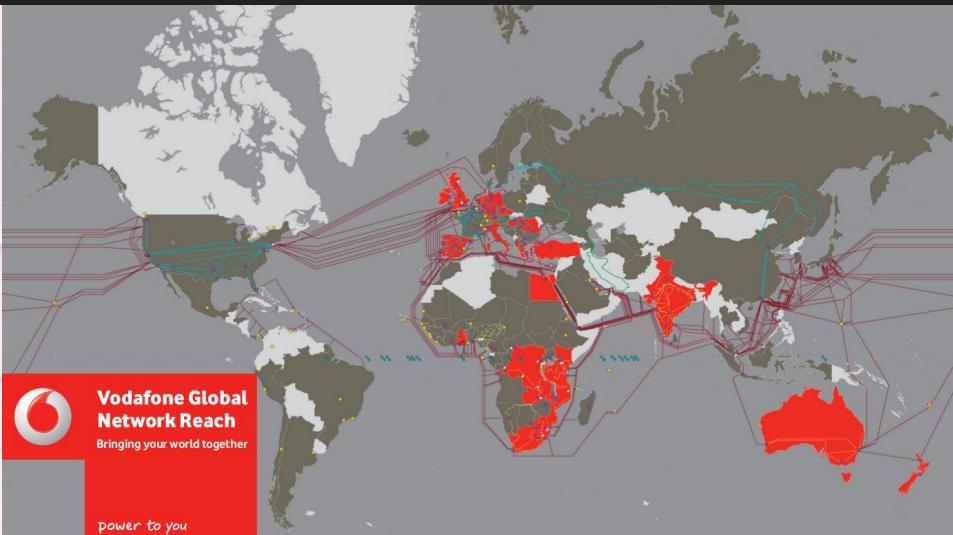
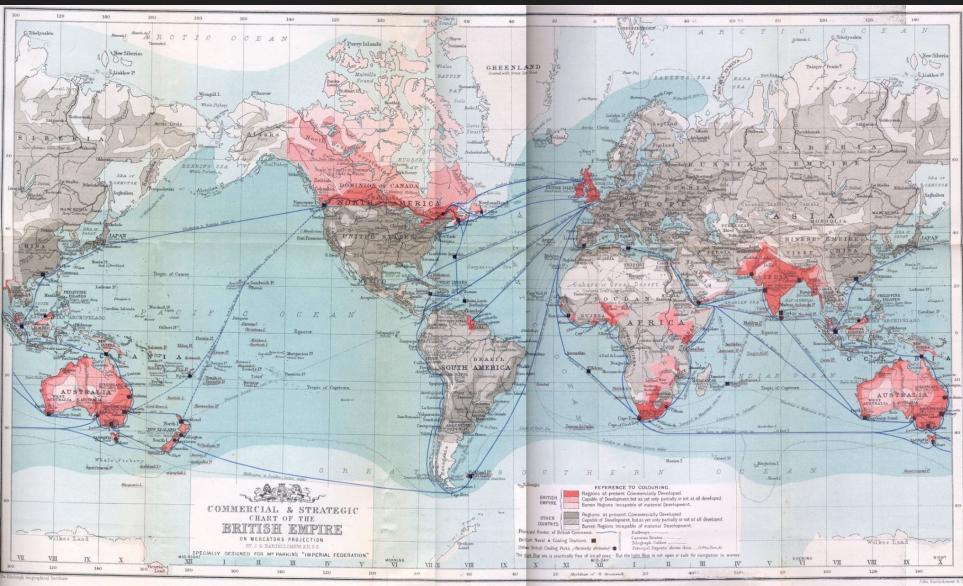
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IETF 83

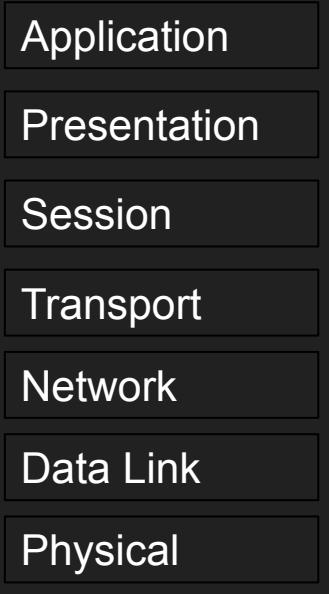


1000 km









API's (for instance for social media networks), HTML, CSS → W3C



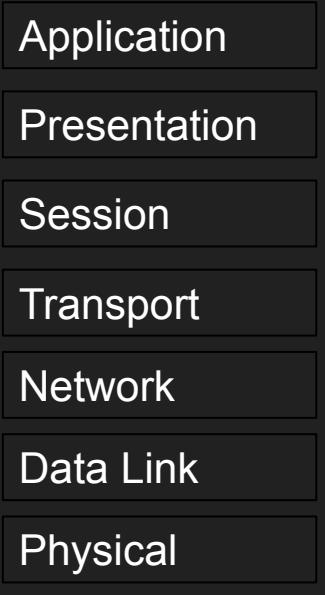
WiFi, ethernet  
→ IEEE



2G, 3G, 4G  
→ 3GPP



HTTP, QUIC,  
TLS, TCP, DNS,  
BGP → IETF



## Orchestration & Automation (MANO, ONAP)

Design

Inventory

Policy

Configuration

RAN Intelligent Controller (RIC) Non-Real Time

A1

Application Layer

### RAN Intelligent Controller (RIC) Near-Real Time

3<sup>rd</sup> party Application

Radio Connection Management

Mobility Management

QoS Management

Interference Management

Trained Model

RAN Database

Multi RAT Control Unit (CU)  
Higher Layer Protocol Stack

CU C-plane

RRC  
PDCP-C

CU U-plane

SDAP  
PDCP-U

NFVI Platform

F1

E2

E2

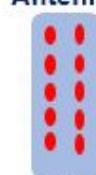
RAN Distributed Unit (DU)  
NFVI Platform

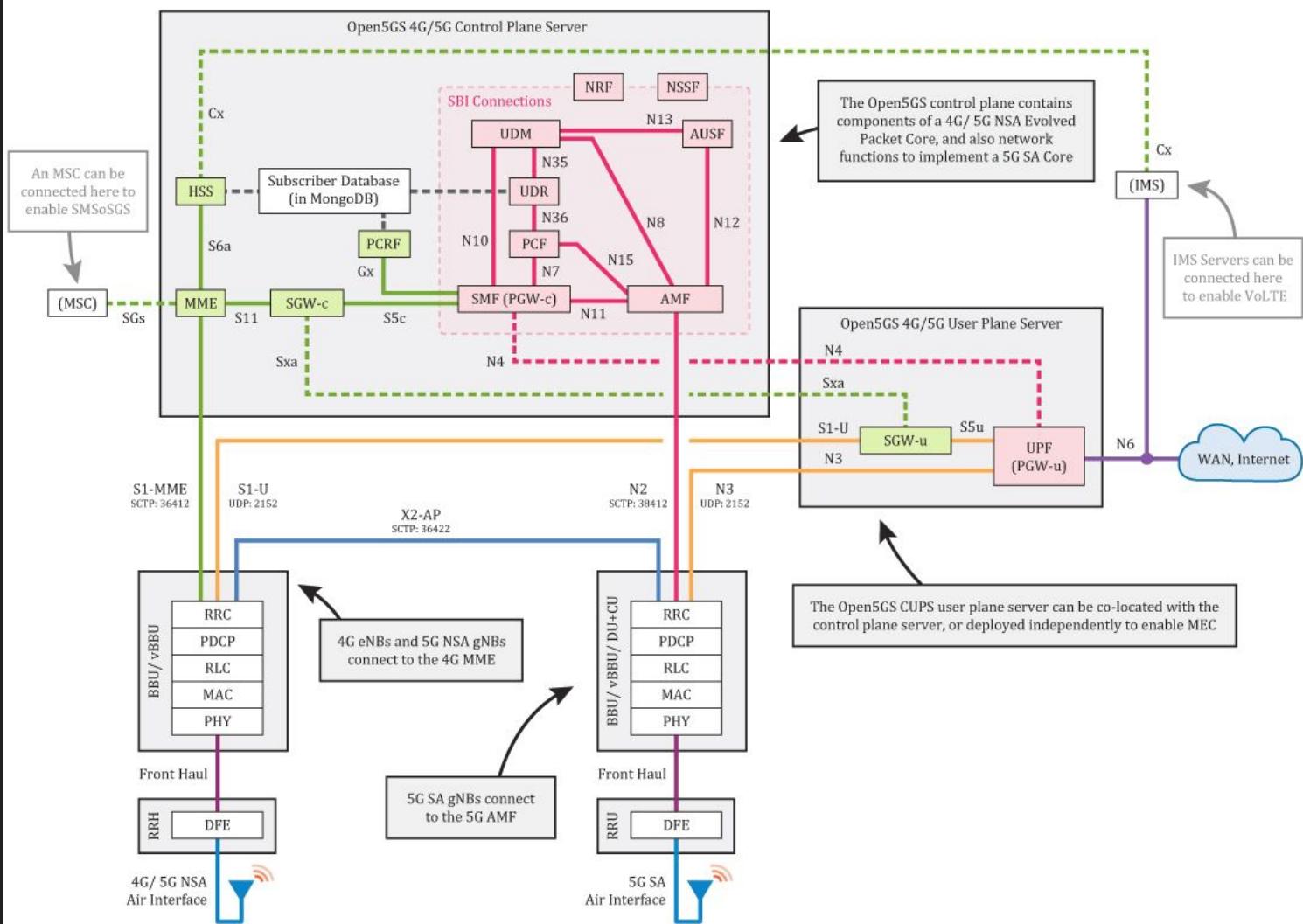
R  
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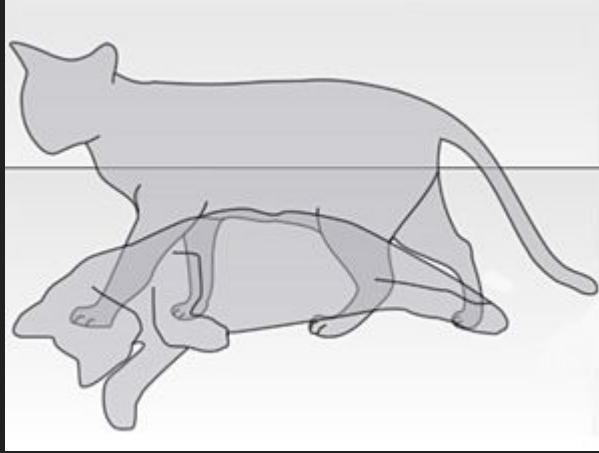
Open Fronthaul

PHY Low  
Remote Radio Unit

Antenna





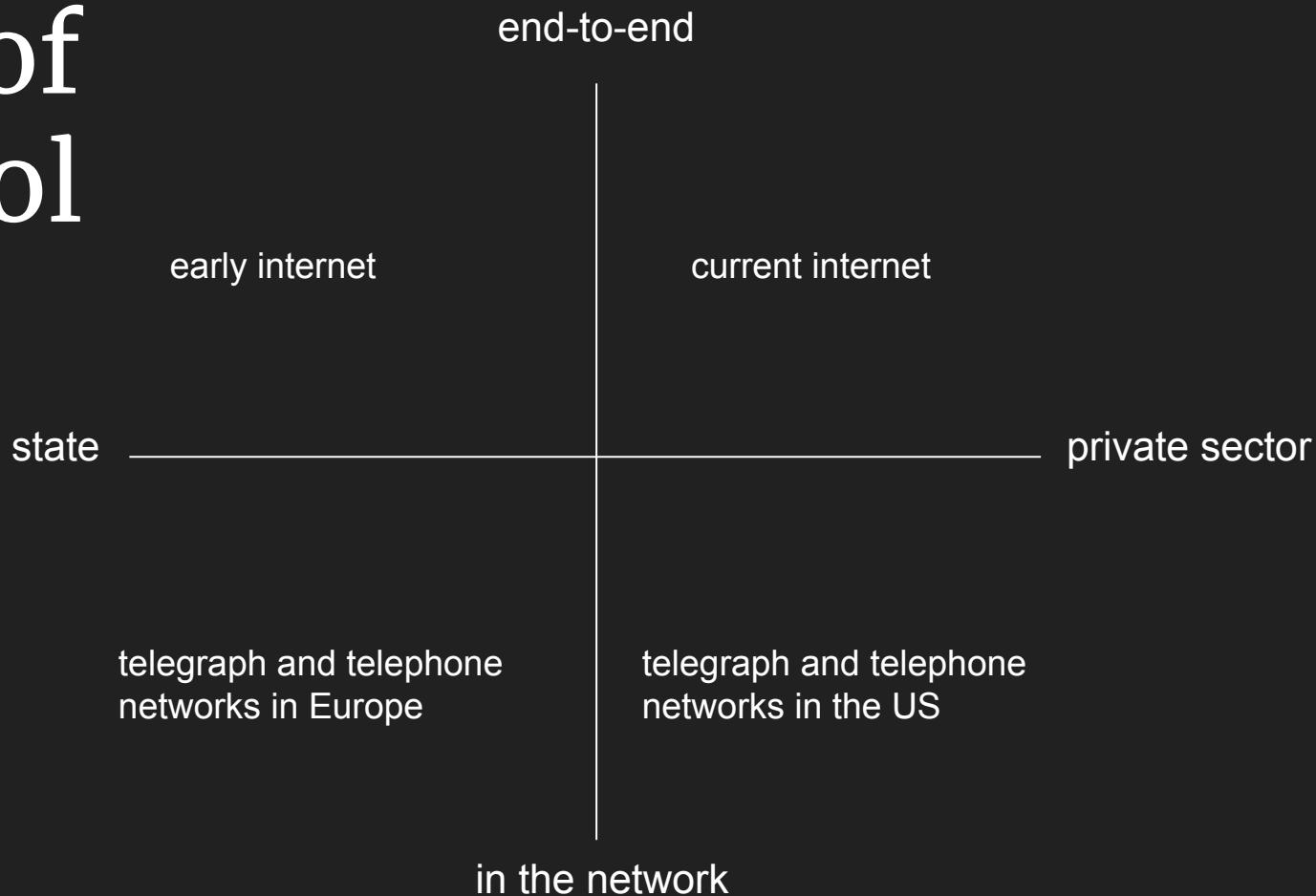


*'5G is not optimized for anything – it is optimized for everything'*

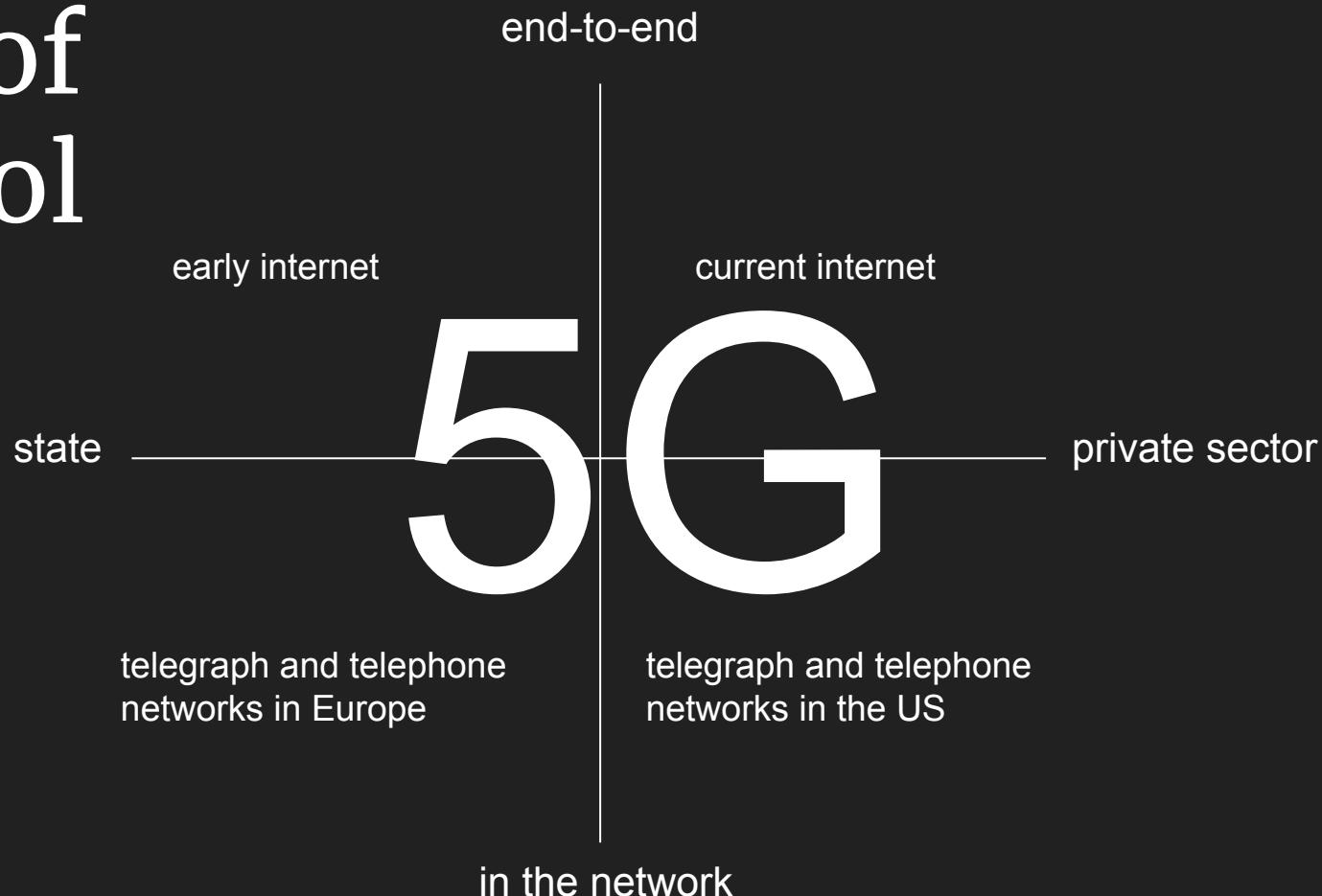
*'Vendors, telecom operators, and ‘verticals’, all create opportunities for the real use case to emerge'*

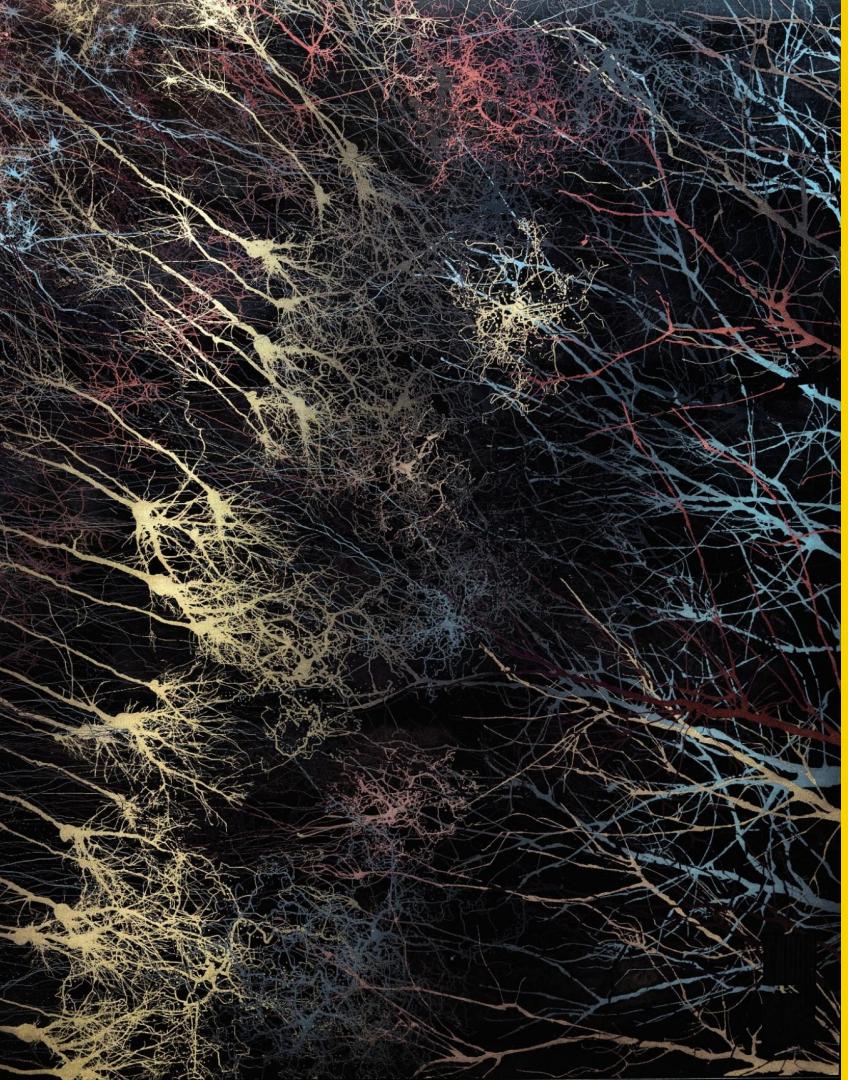


# Axes of control



# Axes of control

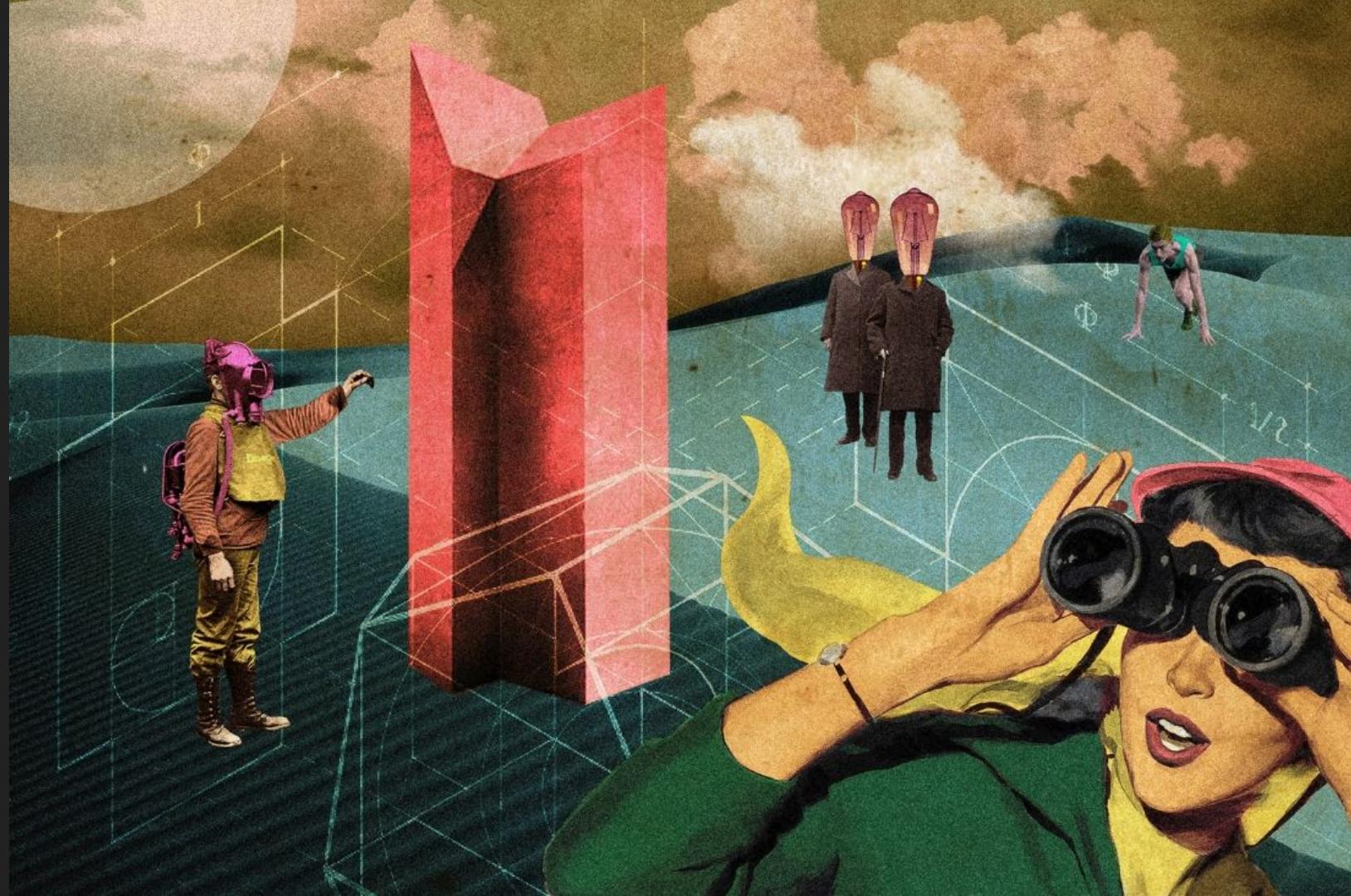




LOVE THE MACHINE



HATE THE FACTORY



```
if write code(protocols):
    consider human rights implications
elif run internet infrastructure:
    respect human rights
elif engage in internet governance:
    build in human rights protections
else
    carry on and use FLOSS
```