

oueees-202306 topic 04:

Cloud computing basics

Social implication of cloud  
computing

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On the internet

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# Lecture notes and reporting

- <https://github.com/jj1wdx/ouees-202306-public/>
- Check out the README.md file and the issues!
- Keyword at the end of the talk
- URL for submitting the report at the end of the talk

# Errata on Topic 03: TCP is *Transmission Control Protocol* (RFC793)<sup>0</sup>

I regret the error. I'm very sorry.

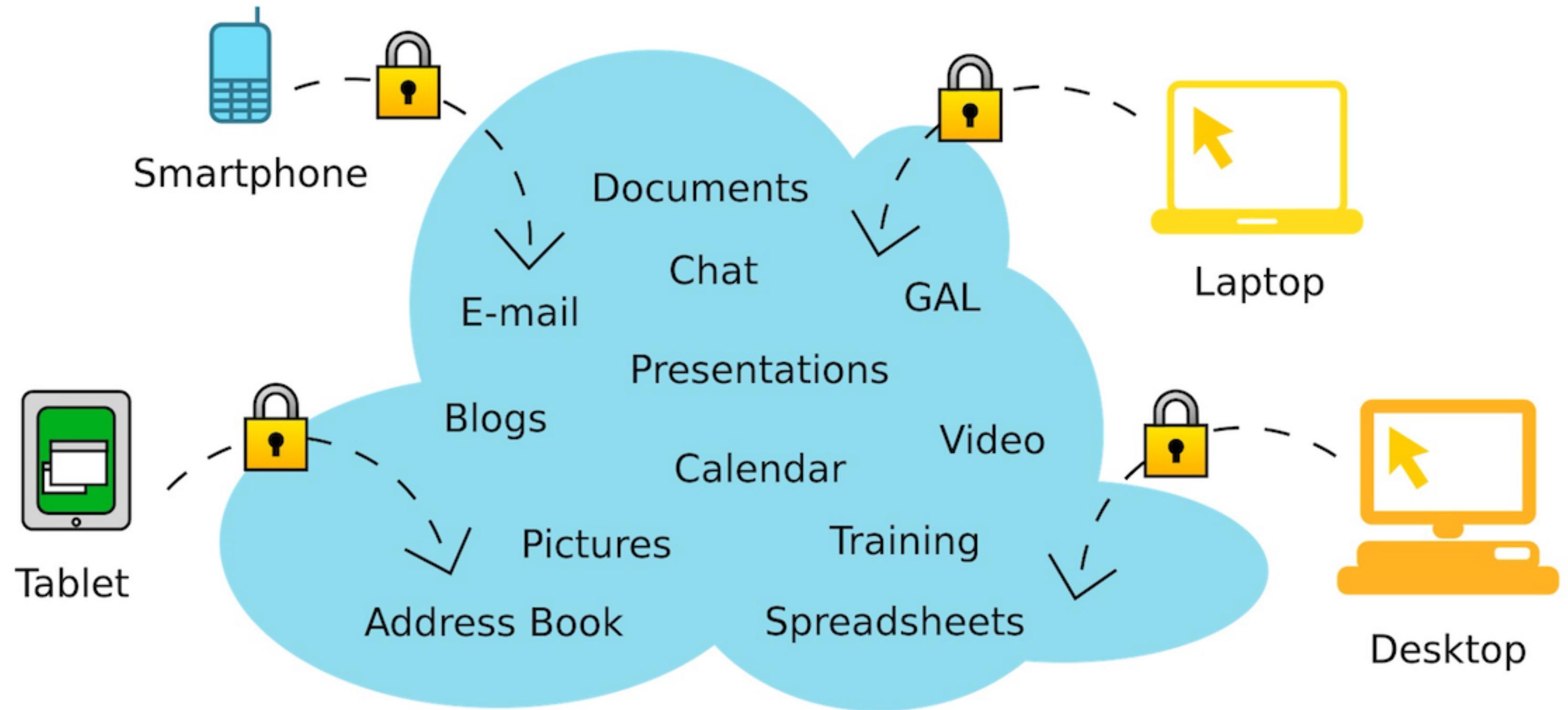
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<sup>0</sup> See also <https://www.ietf.org/archive/id/draft-ietf-tcpm-rfc793bis-28.html>

# Cloud computing basics



*Modern computing is cloud computing*



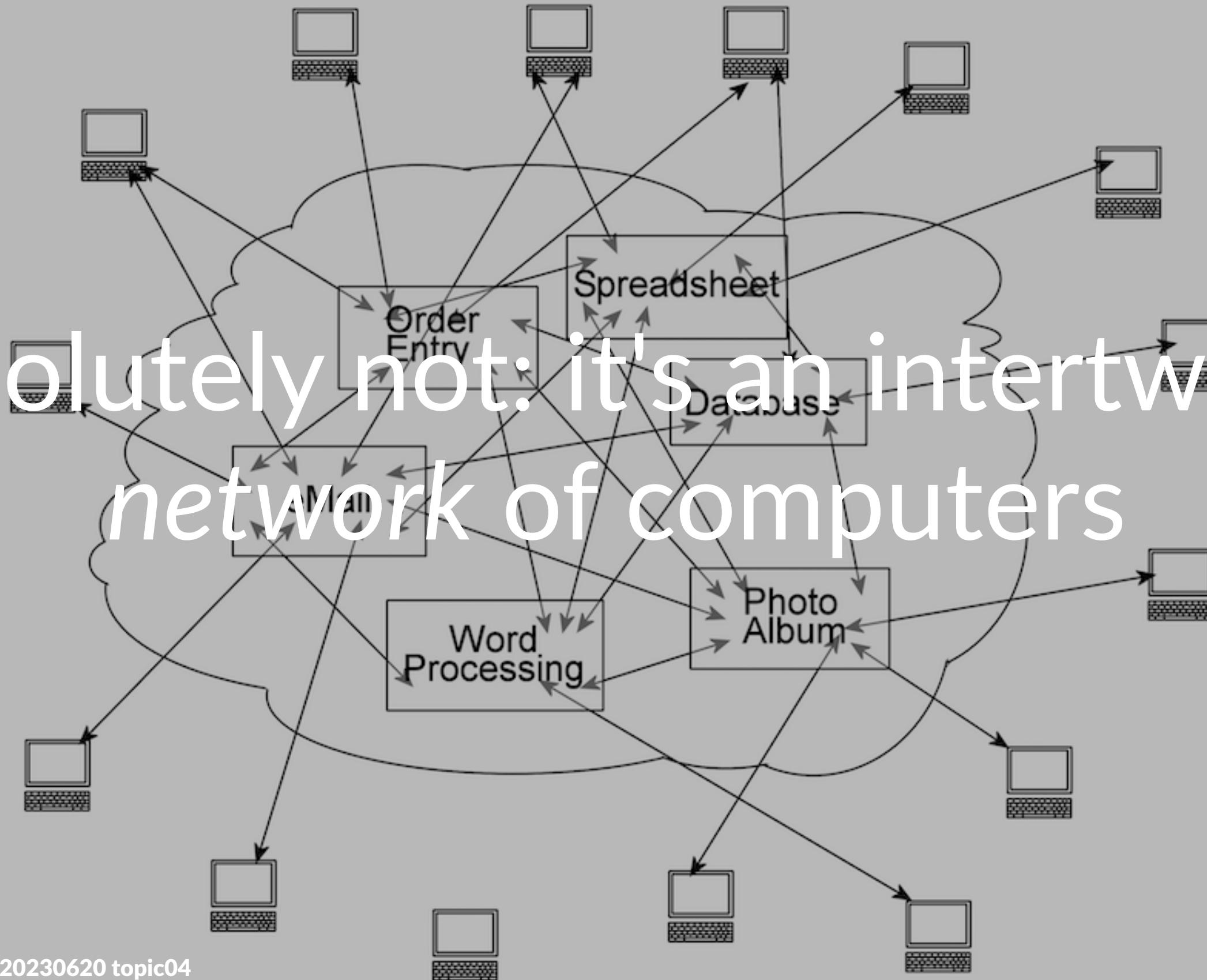
# Cloud Computing

*Having secure access to all your applications and data from any network device*

# Is cloud really a uniform and single entity?

## Cloud Computing

Absolutely not: it's an intertwined  
network of computers



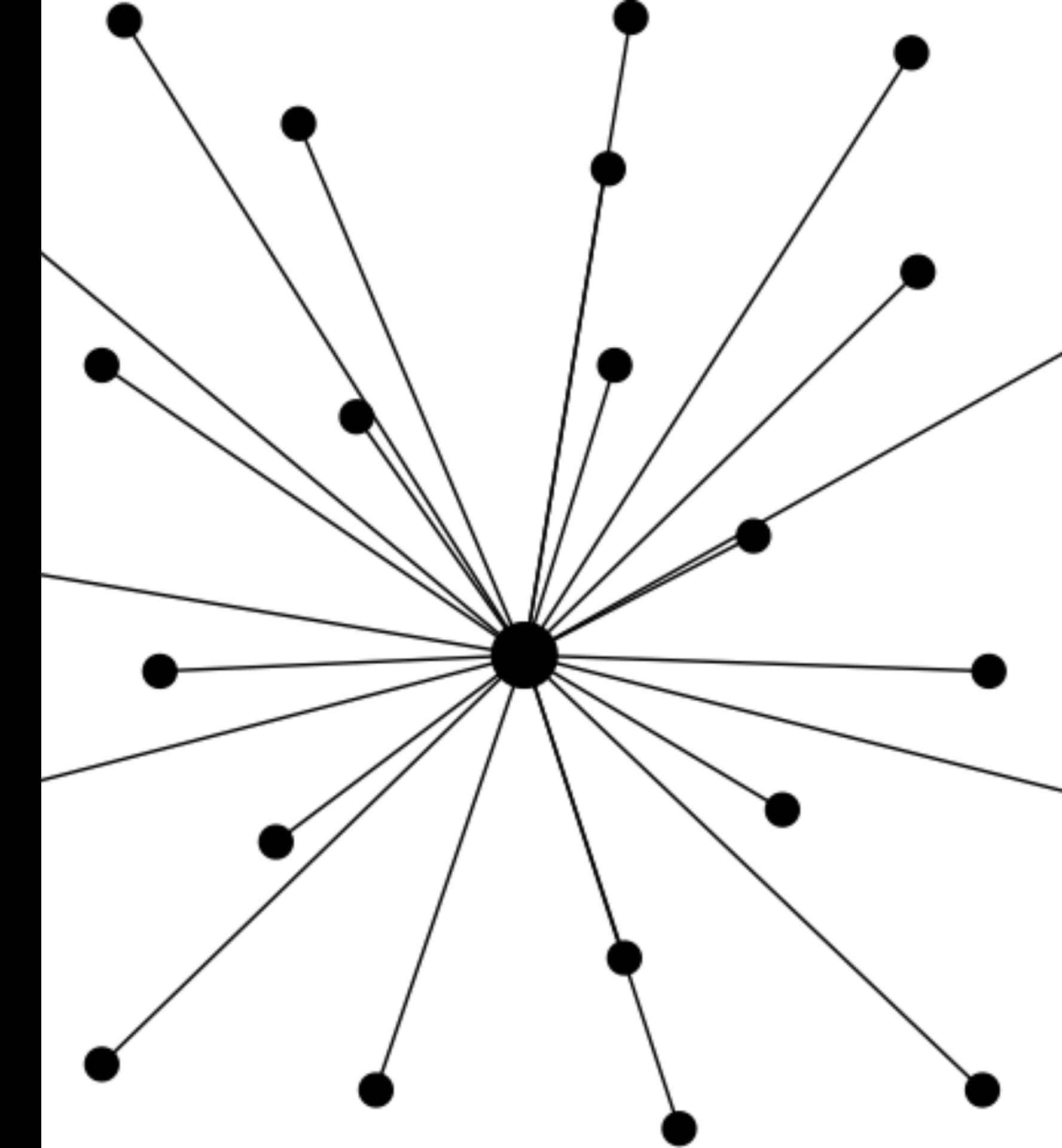
# Web services are clusters of computers and networks

Thousands or millions of servers  
connected together

A physical server is separated into multiple  
virtual machines

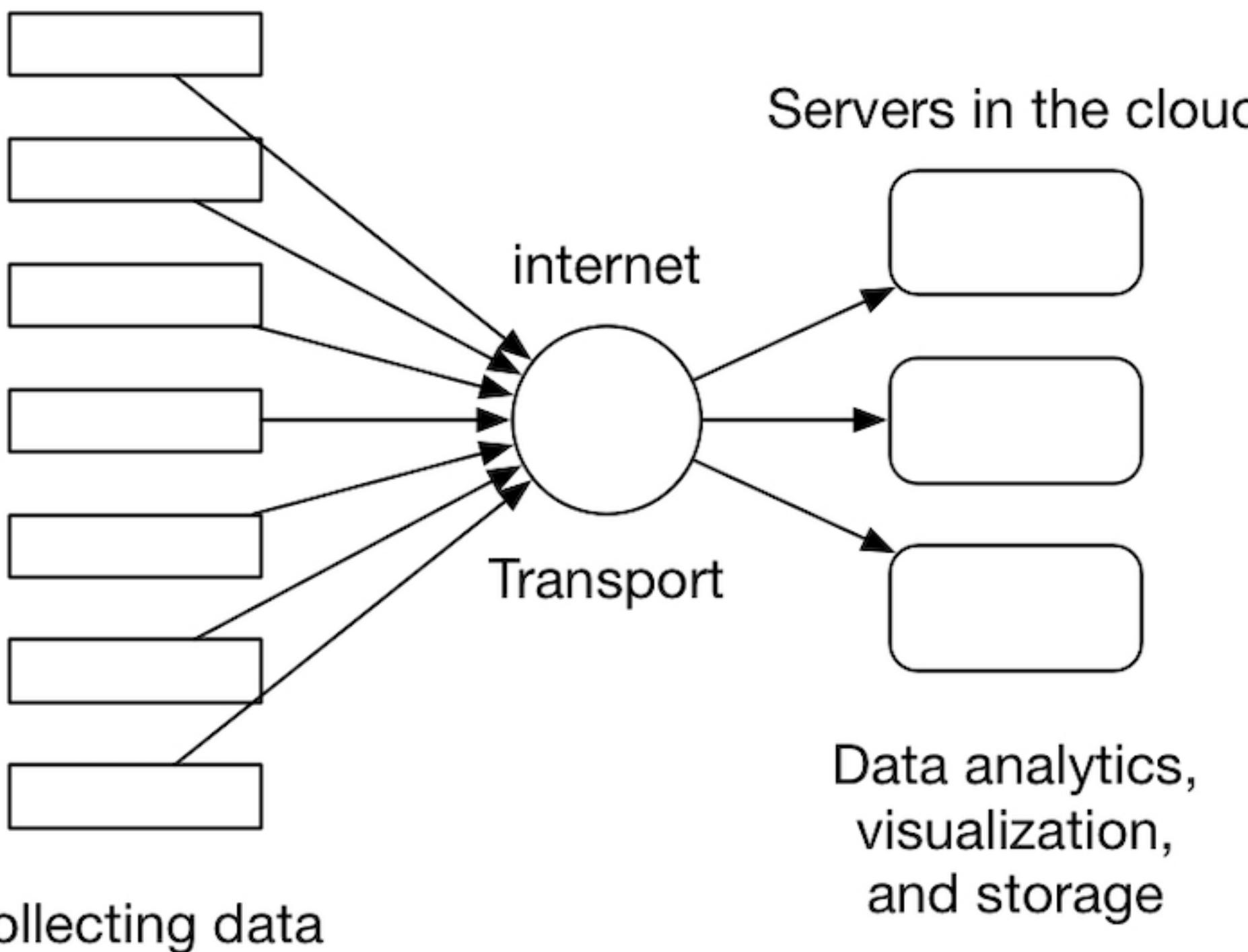


Cloud computing *is*  
centralization



# An example of cloud computing: Internet of Things (IoT) and telemetering

“Things” or devices



Collecting data

Servers in the cloud

internet

Transport

Data analytics,  
visualization,  
and storage

# Telemetering

- Mostly unidirectional (not really *the true and genuine internet*)
- Sensors/devices gathering data through internet and feed them to the servers in the cloud computing platforms
- *The servers compute*
- *Extremely centralized*

# Social implication of cloud computing

# Centralized social behavior accelerated by cloud computing

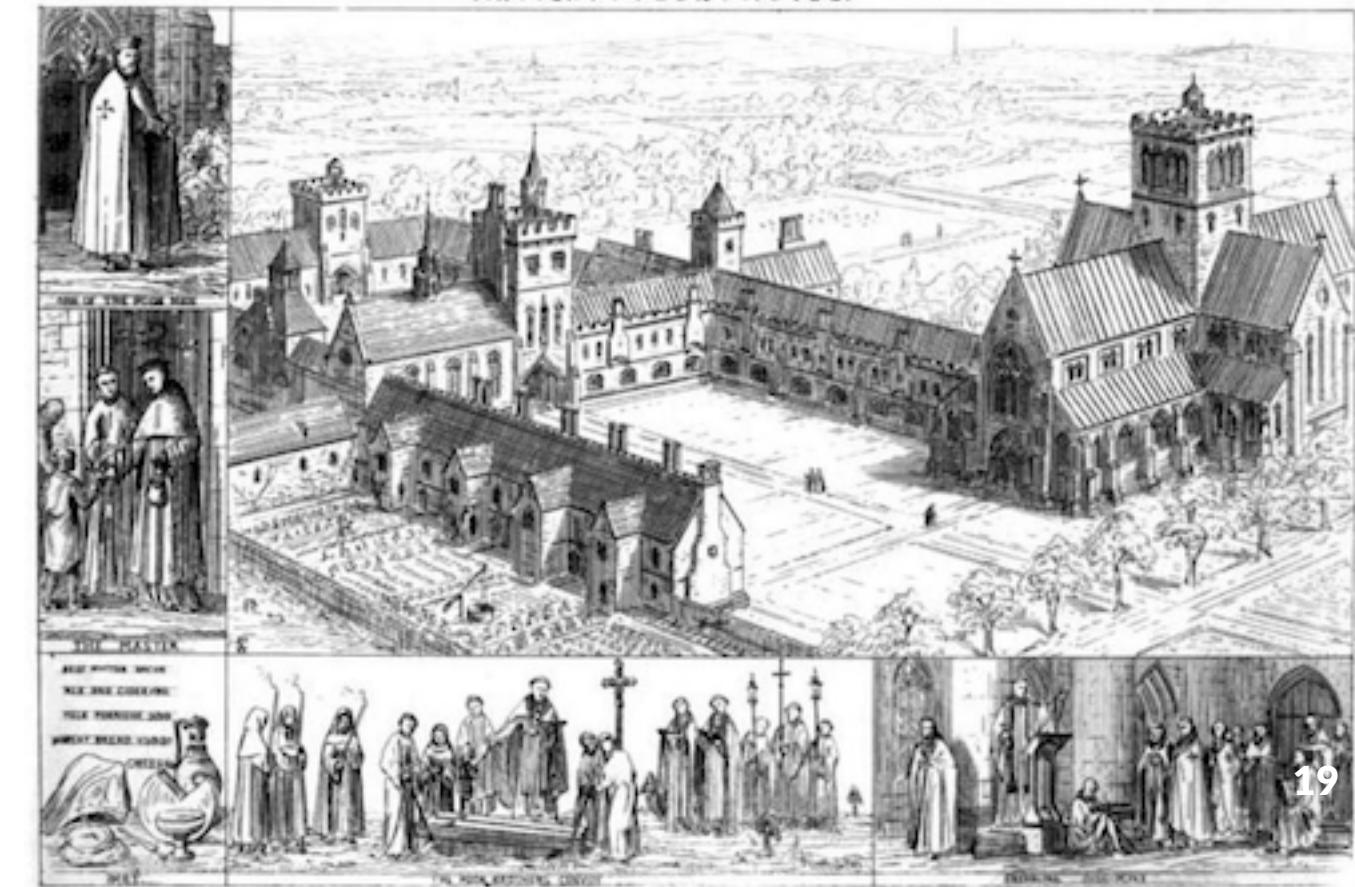
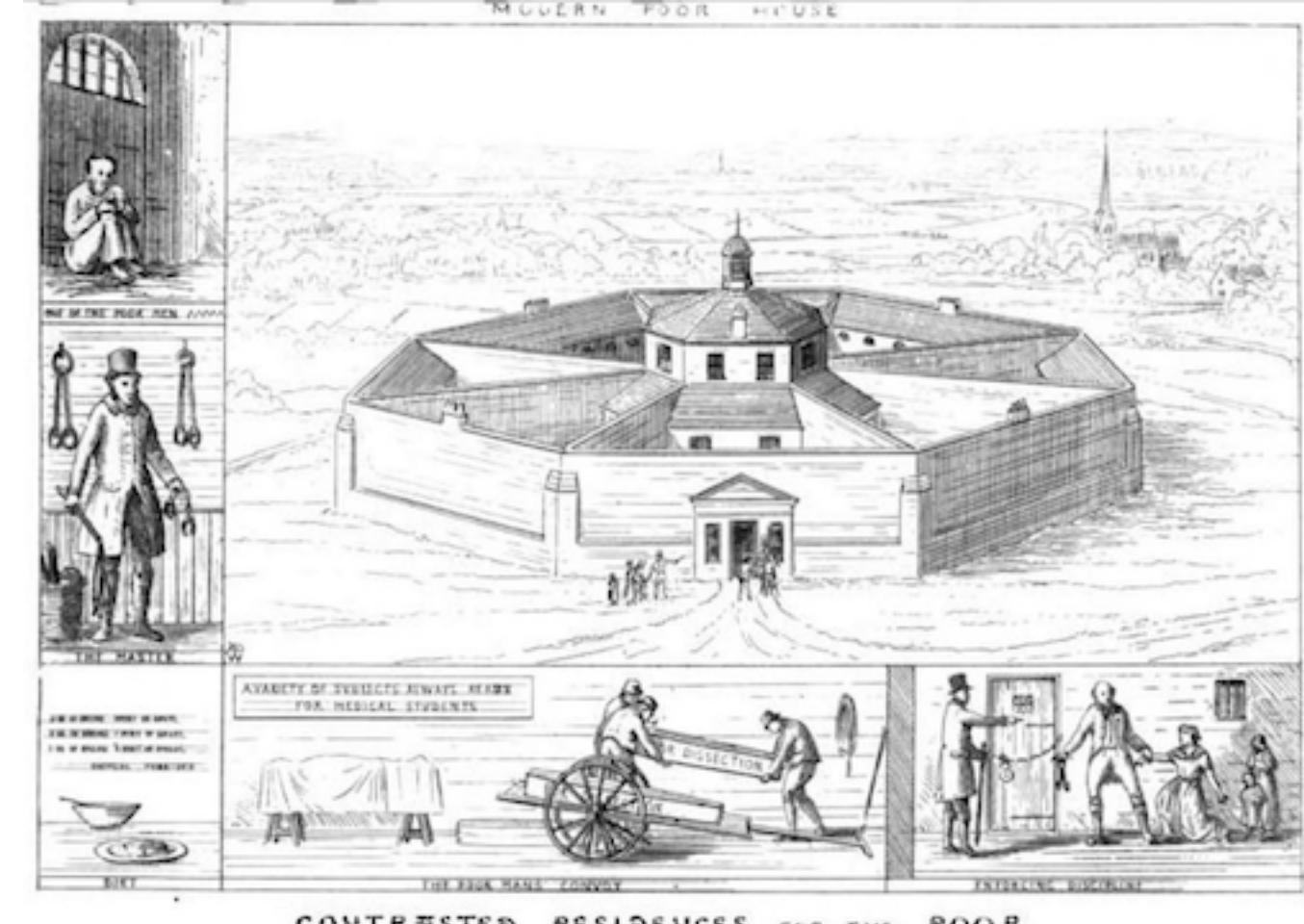
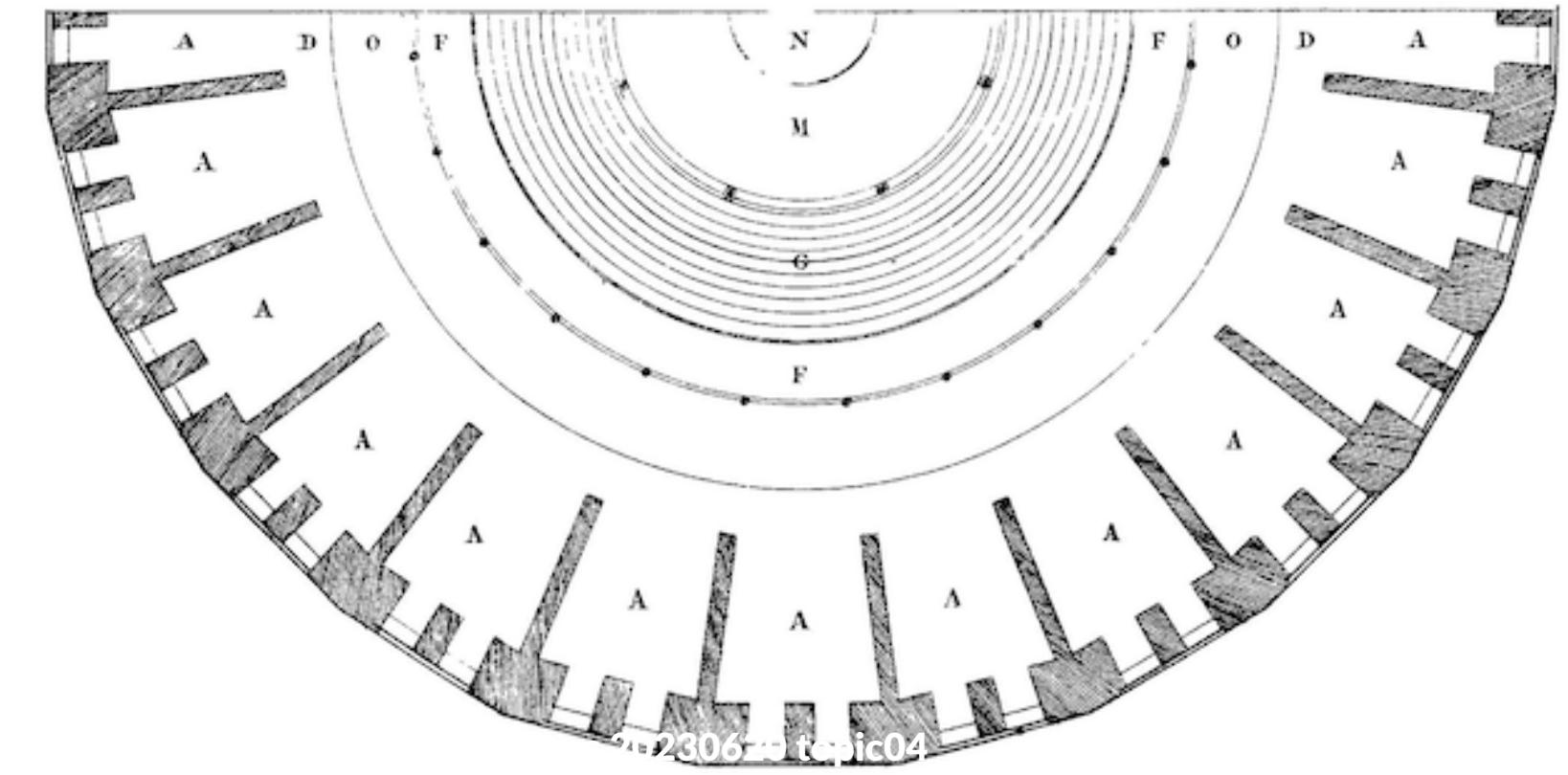
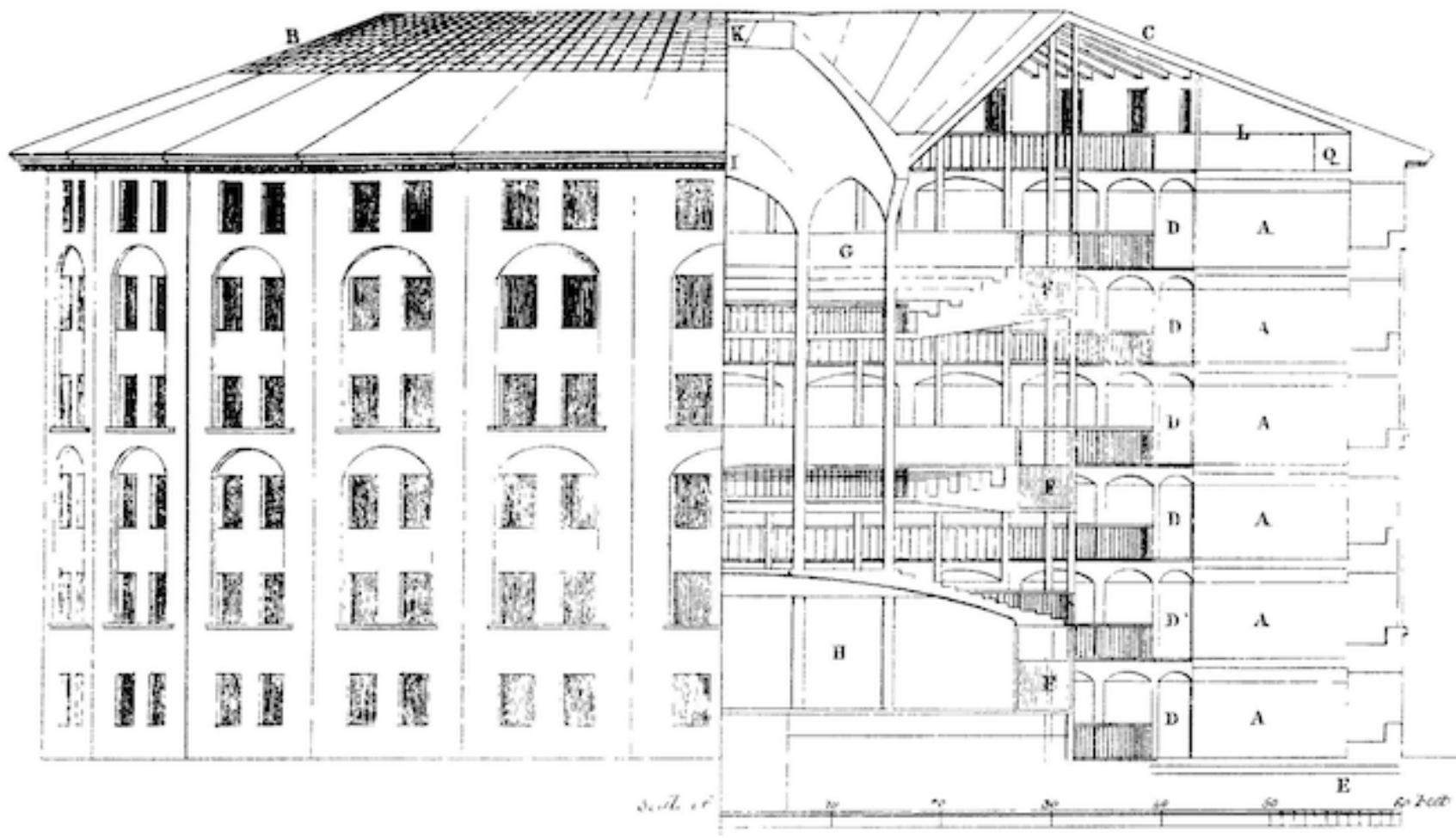
- Sharing *everything* - no privacy
- *Panopticon*<sup>1</sup> style of governance, filtering, censorship, or autocracy
- Complete *externalization* of resources, leading to *no personal control*

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<sup>1</sup>n. a circular prison with cells arranged around a central well, from which prisoners could at all times be observed.  
(New Oxford American Dictionary, Apple macOS 10.13.6)

# Presidio Modelo: a panopticon prison





# INGSOC: the slogans <sup>2</sup>

- War is peace
- Freedom is slavery
- Ignorance is strength
- Independent thinking = *thoughtcrime*

NOTE: this is a *fiction!*

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<sup>2</sup> George Orwell, "Nineteen Eighty-Four", 1949.

# Historical examples of INGSOC-like nations

- Nazi Germany<sup>3</sup>
- Empire of Japan<sup>4</sup> (Japan in 1868-1947)
- Soviet Union<sup>5</sup>

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<sup>3</sup> [https://en.wikipedia.org/wiki/Nazi\\_Germany](https://en.wikipedia.org/wiki/Nazi_Germany)

<sup>4</sup> [https://en.wikipedia.org/wiki/Empire\\_of\\_Japan](https://en.wikipedia.org/wiki/Empire_of_Japan)

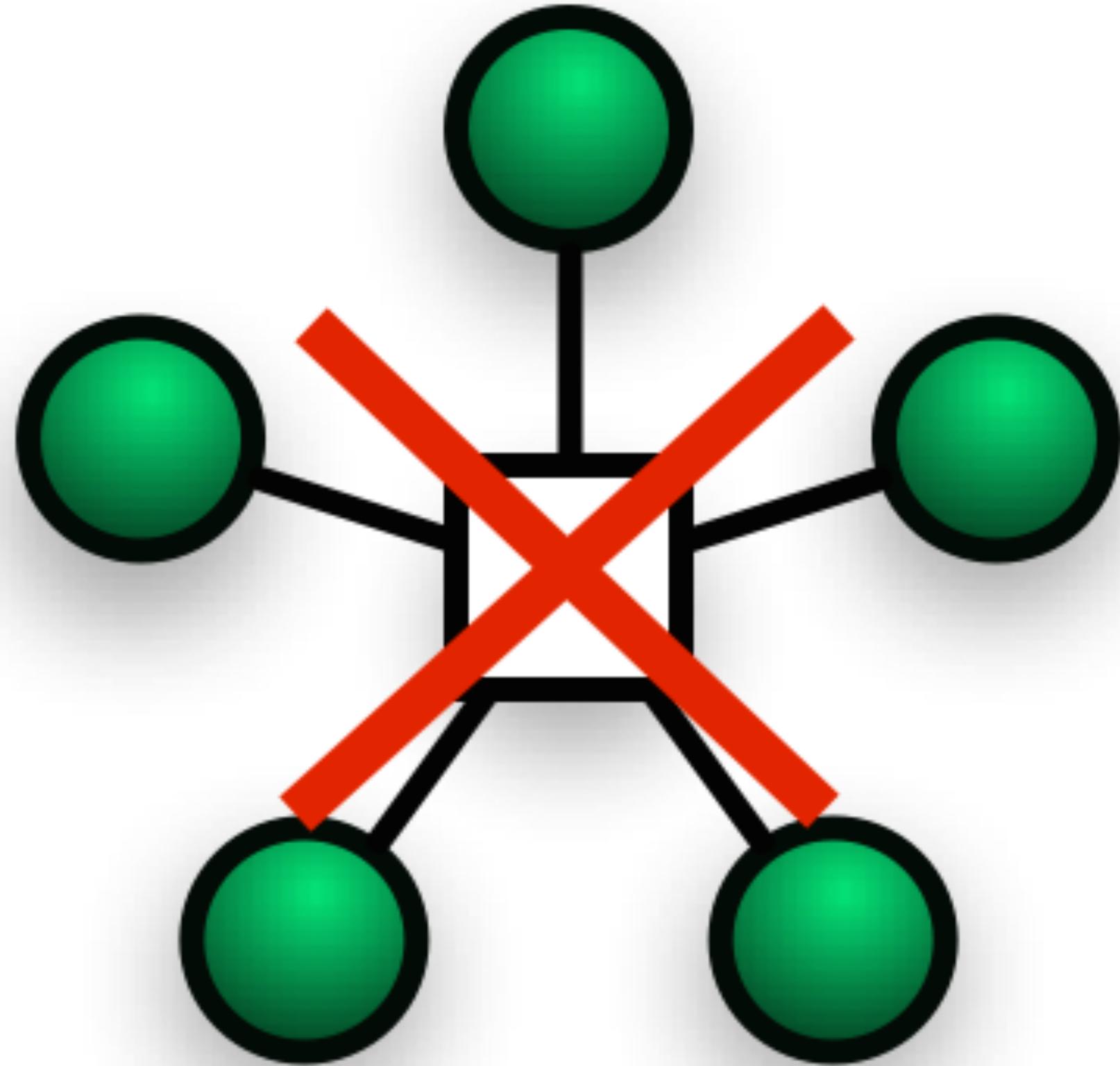
<sup>5</sup> [https://en.wikipedia.org/wiki/Soviet\\_Union](https://en.wikipedia.org/wiki/Soviet_Union)

Why cloud computing has become  
so dystopian?

# We have sold freedom for convenience

- Ubiquitous/global accessibility
- Concentrated data for easy analysis
- Easy control of the information flow
- No extra cost for sharing
- No need to think about where the information locates
- A useful tool for fascist and despotic regimes

The inconvenient  
truth of centralized  
systems: what if the  
core/cloud fails?



# Inconvenience of centralized systems

- Ubiquity or *no accessibility*
- When the core fails, no alternative
- When the core loses data, *no backup*
- The system performance is restricted by the capability of the core
- Endpoint systems will lost *all capabilities*

Centralized systems are not  
sustainable

...then how cloud computing systems manages  
the sustainability?

Distributed systems provide  
sustainability and resilience against  
failures

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- Web services are clusters of computers: Kenji Rikitake, at Kyoto University ACCMS, April 2017