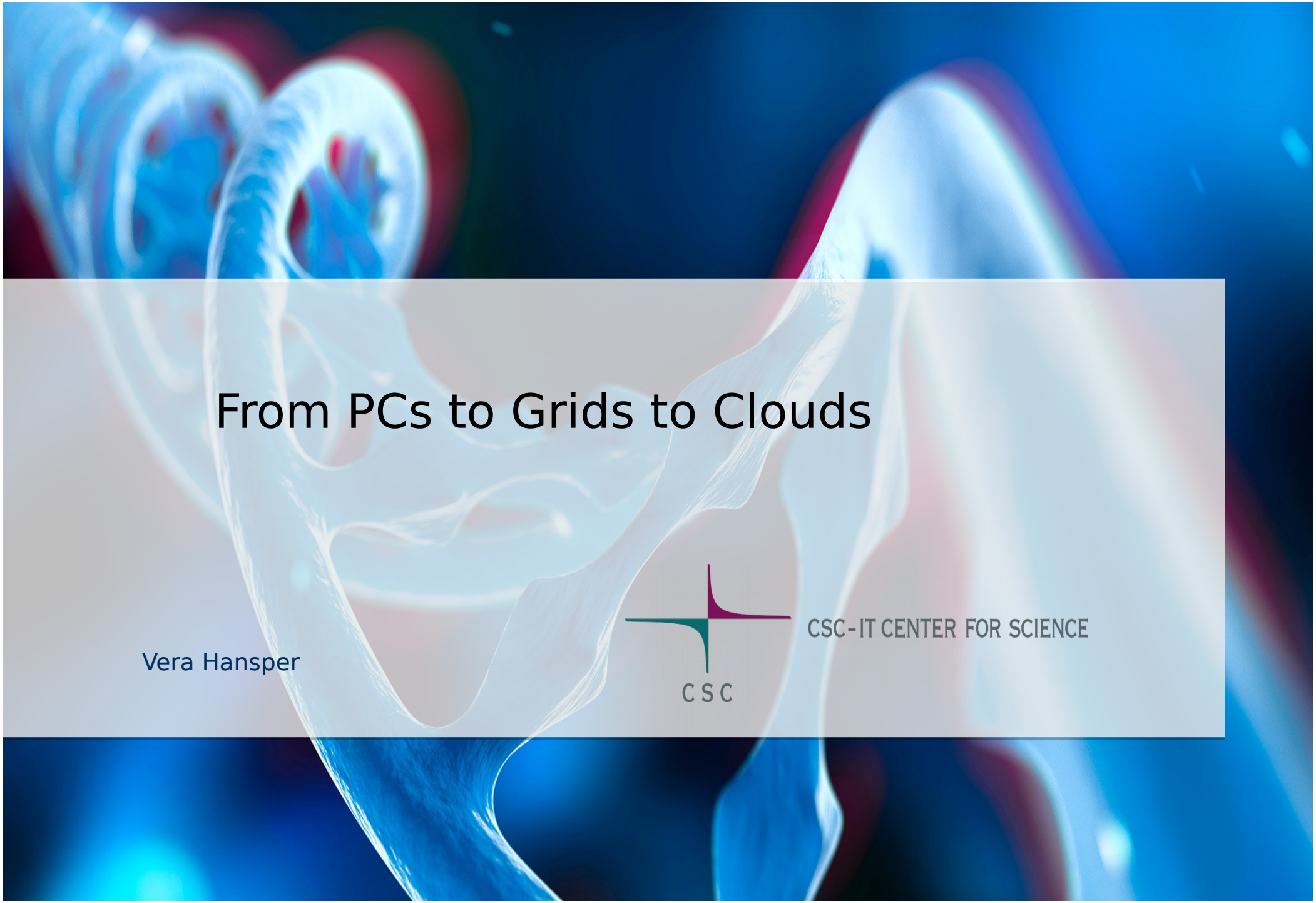


# From PCs to Grids to Clouds

Vera Hansper

CSC – IT CENTER FOR SCIENCE

# *In the beginning, before there were clouds:*

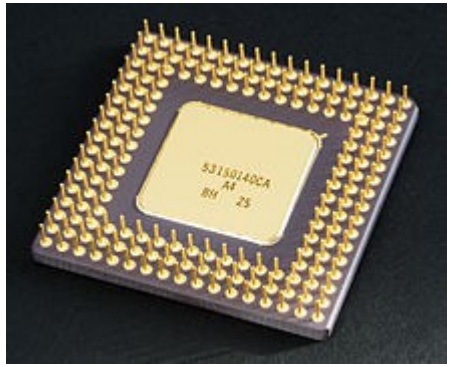

Oooh, is that a new iPad?

# *A **brief** history:*

- Background (history ) of computing
  - How far back does one want to go?
  - PCs (as we know them) first emerged in the 70s
    - But there was a lot of build up to this point
  - IBM had the precursor of the MS systems
    - BUT Apple actually preceded them

https://en.wikipedia.org/wiki/Timeline_of_computing

# *Inside – they're all the same*



Intel 80486DX CPU. Bottom view with gold plated pins ----
Ref: wikimedia (CCASA2 : photo by Andrew Dunn)

⊕


elixir 512MB DDRAM for desktop computers.
Re: wikimedia, public domain

=

TRS-80 Model I computer system
Ref: wikimedia (CC-BY-SA-3 : from Rechnermuseum by FLOMINATOR

Vintage Antique PC Hard Drive KALOK Octagon KL 320 20MB Computer HDD
Ref:http://www.samapsandflags.co.za/Collectible%20Pages/PC%20Hardware.htm

Appropriate branding!

Network, if you were lucky, was through a modem – around 300 to 1200 baud ...

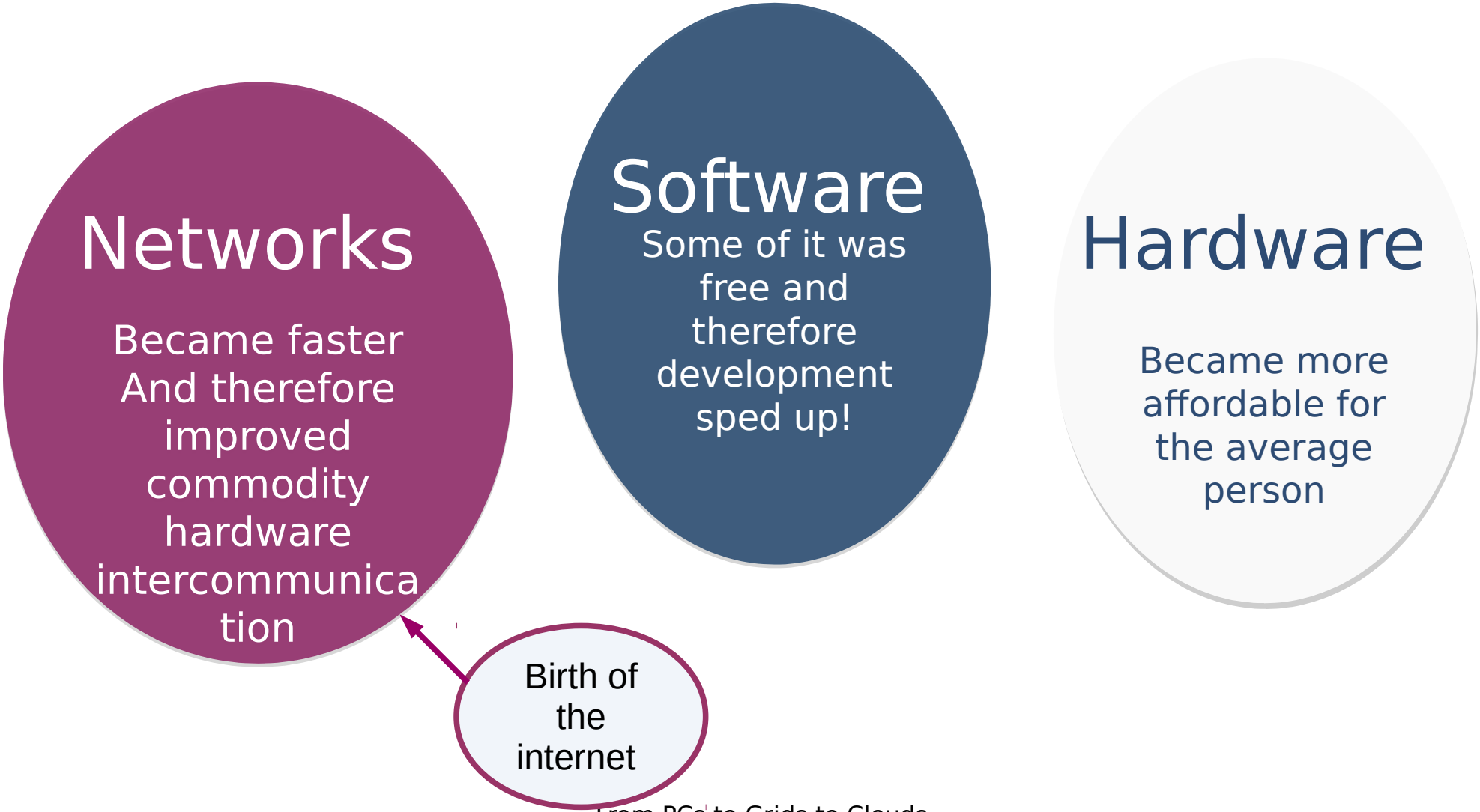
# *The influence of free software*

1983 - GNU project,
lead by Richard Stallman

1991 – LINUX,
developed by Linus Torvalds

First distribution releases of LINUX happened in 1992 … and scientists were quick to take on the revolutionary new UNIX-like operating system.

# Revolutions in technologies

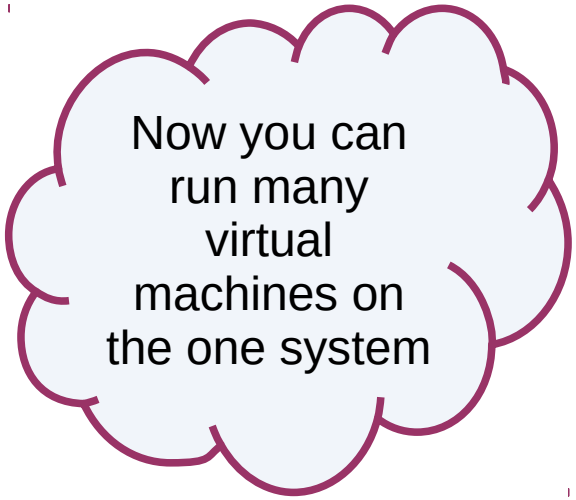


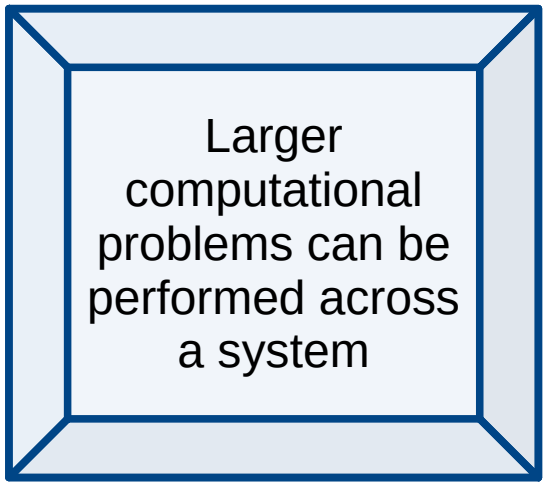
# The impact of multicores and 64-bit

- More processing power for some programs while keeping the CPU cooler
- Energy efficiency
- Allows for more threading!
- Allows for faster inter-CPU  communication

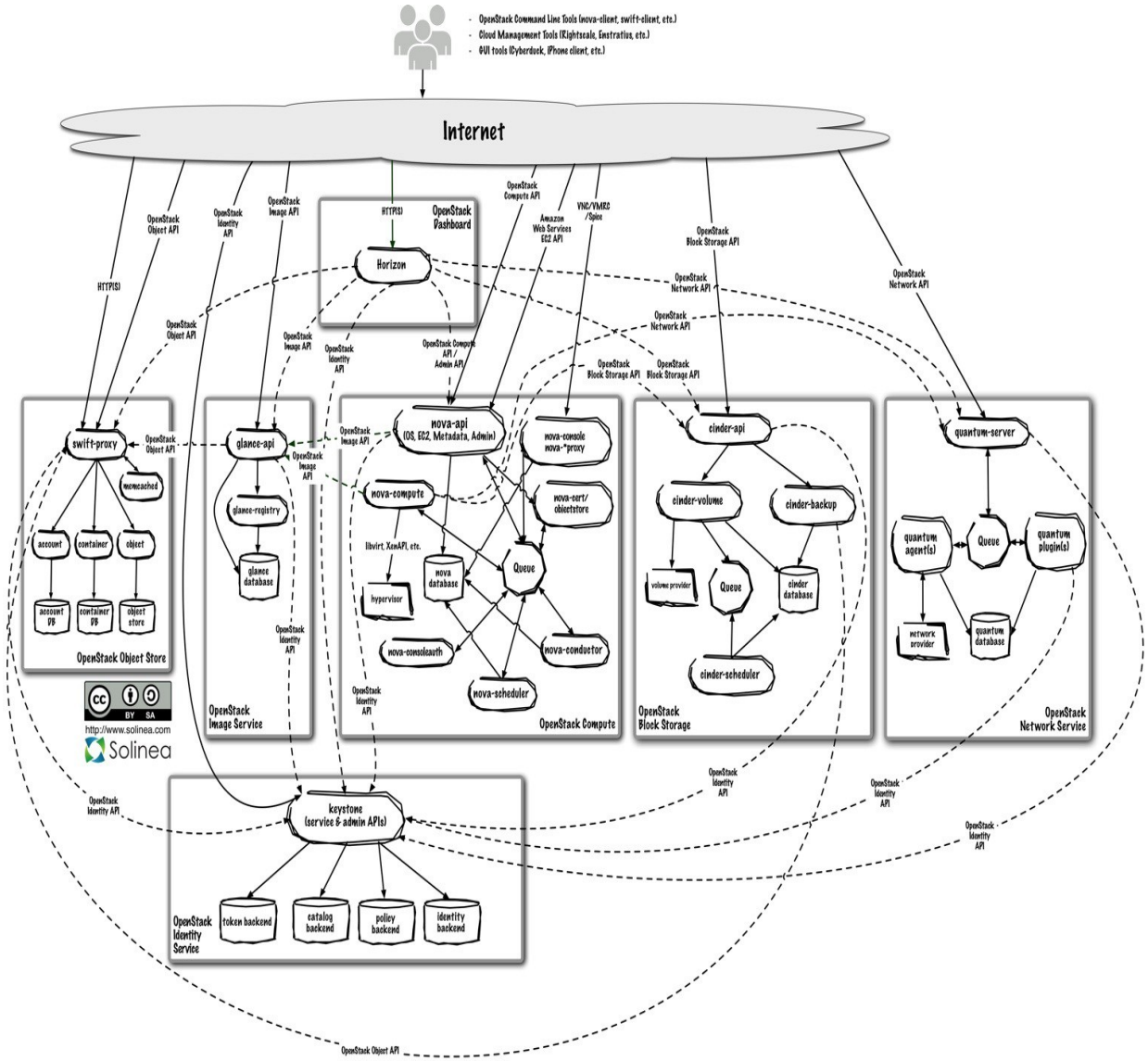
- Finally calculations could extend arithmetically to $2^{64}$
- Commercial UNIX flavours have diminished – LINUX is dominant

**SUPERCOMPUTERS run LINUX**

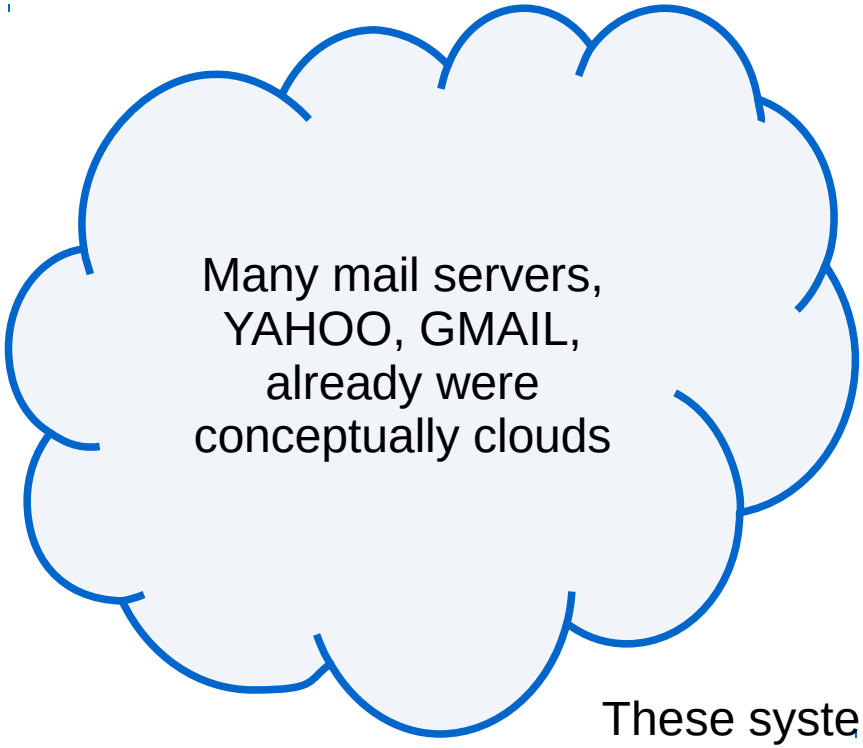


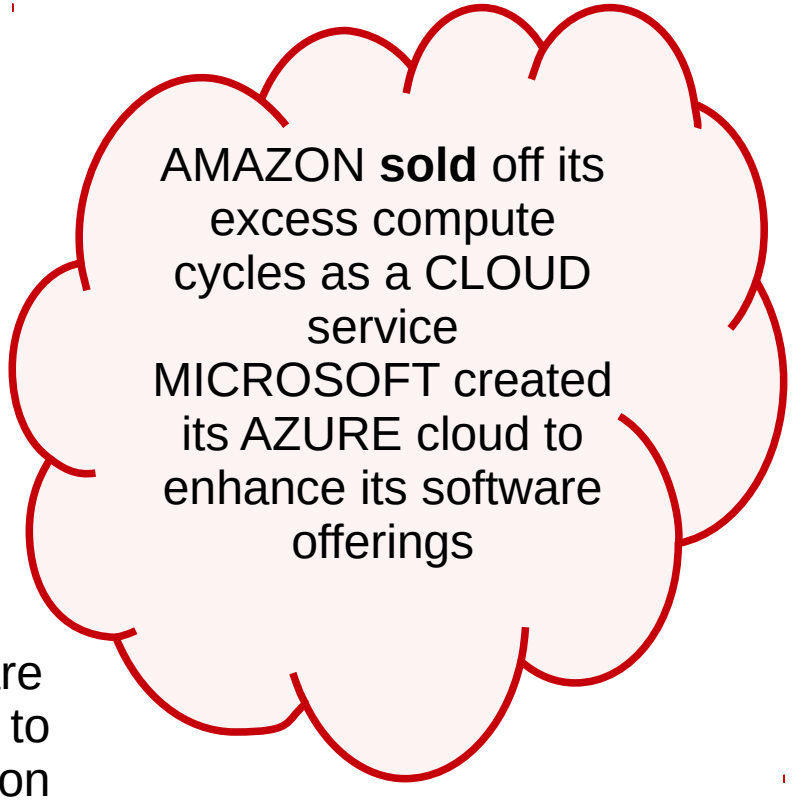



# Architecture



# *Early Cloudy marketing*



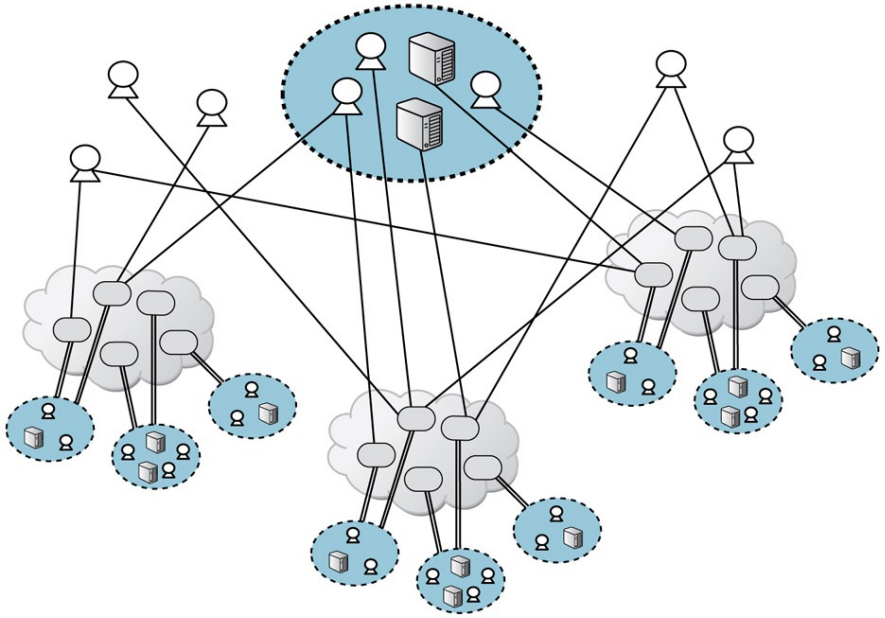




These systems are easily accessible to the average person

# *Where we are today:*

A number of different cloud systems …

Various open source systems that are easily deployable



# *Commercial Clouds*

## PROS

- Easily accessible
- Gives opportunities to collaborate across academic or national boundaries

## CONS

- Can become **expensive** (there are many hidden costs
- No software support
- There is no guarantee that your instance will be available for the time needed.

# *Academic/Research Clouds*

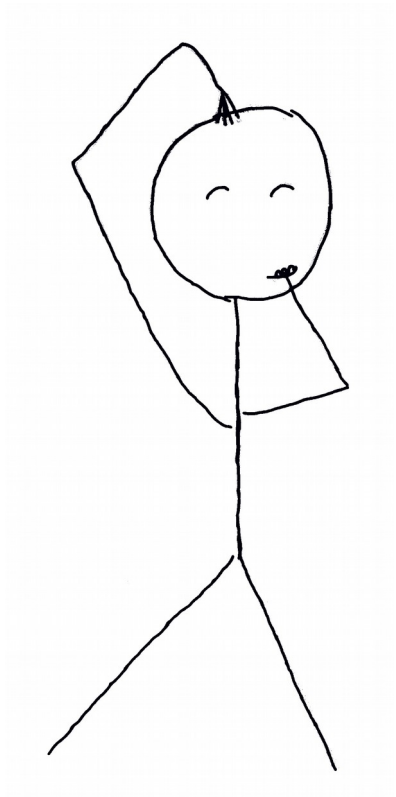
## PROS

- **FREE**
- Software is generally supported
- Your **instance** is more or less guaranteed.

## CONS

- Can sometimes be difficult to access (depends on how good the IT that supports it knows CLOUDS!)
- Can be awkward to do international collaboration

# What should I use?

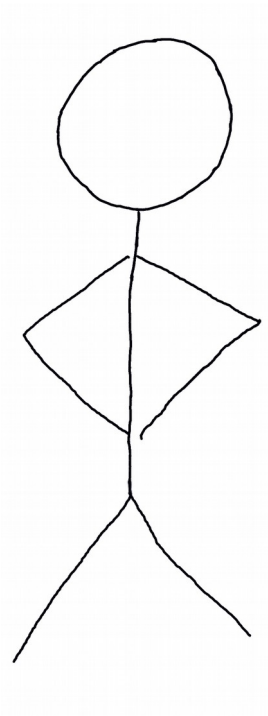


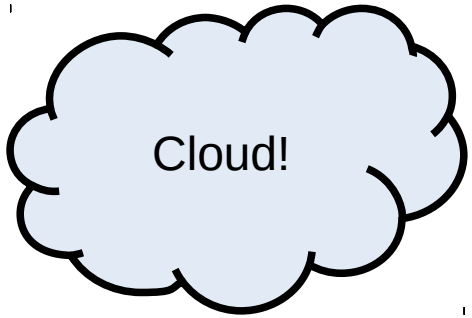
Emulator?

VM?

Bare Metal?

But I just want to use





# *What is best for me …*

ACADEMIC/Research

- Need guaranteed performance
- Have many or long calculations
- Need support with ANYTHING!

COMMERCIAL

- Want to test functionality
- HAVE NO storage or large data transfer requirements
- Run small urgent jobs …

- Don’t have an affiliation with an research cloud provider

# References:


- https://en.wikipedia.org/wiki/History_of_personal_computers
- https://en.wikipedia.org/wiki/History_of_Linux
- http://readwrite.com/2011/08/25/as-steve-jobs-steps-down-linux/
- https://en.wikipedia.org/wiki/Timeline_of_computing
- https://en.wikipedia.org/wiki/Abacus
- https://en.wikipedia.org/wiki/World_Wide_Web
- https://en.wikipedia.org/wiki/Virtual_machine
- http://jpc.sourceforge.net/oldsite/Emulation.html
- http://www.virtualizationadmin.com/blogs/lowe/news/what-difference-between-emulation-vs-virtualization.html
- Any search including  terms like: computers history cloud

*THANK YOU*