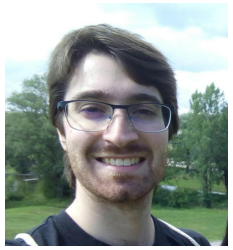
Management and Administration of IT Infrastructures and Services

(a.k.a. AGISIT)

MEIC/METI - DEI - Instituto Superior Técnico

Team

Miguel Matos



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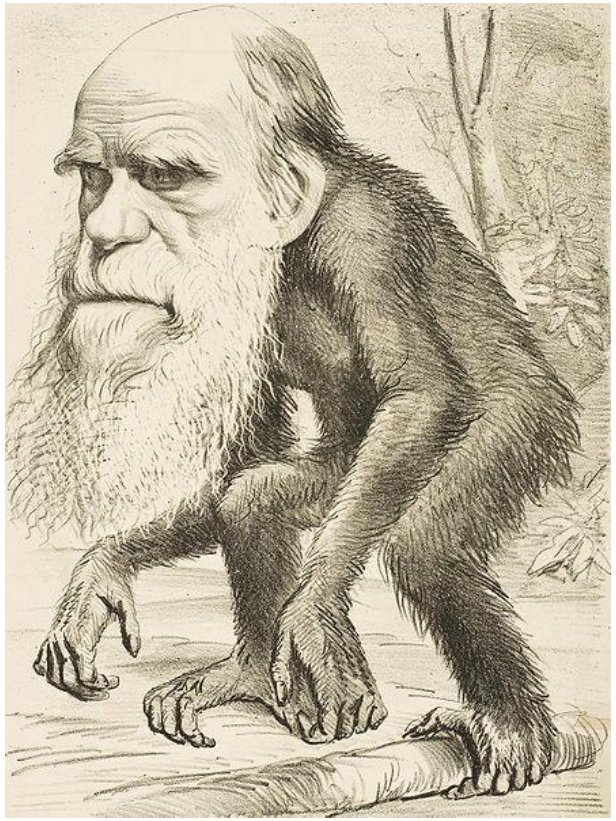
Management and Administration of *IT* Infrastructures and Services

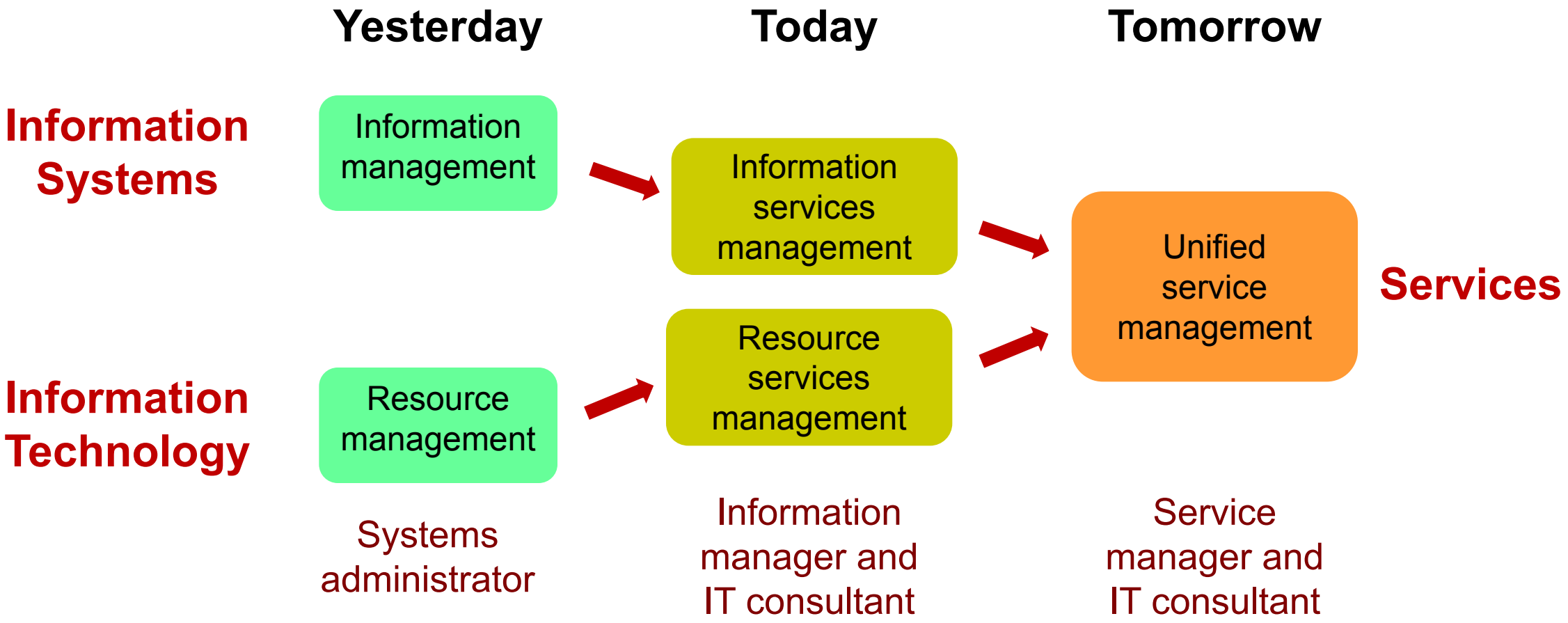
"Information technology (IT) is the use of computer systems, software, networks, and related devices to create, store, manage, process, and exchange data."

Why AGISIT? Why IT? Why Services?

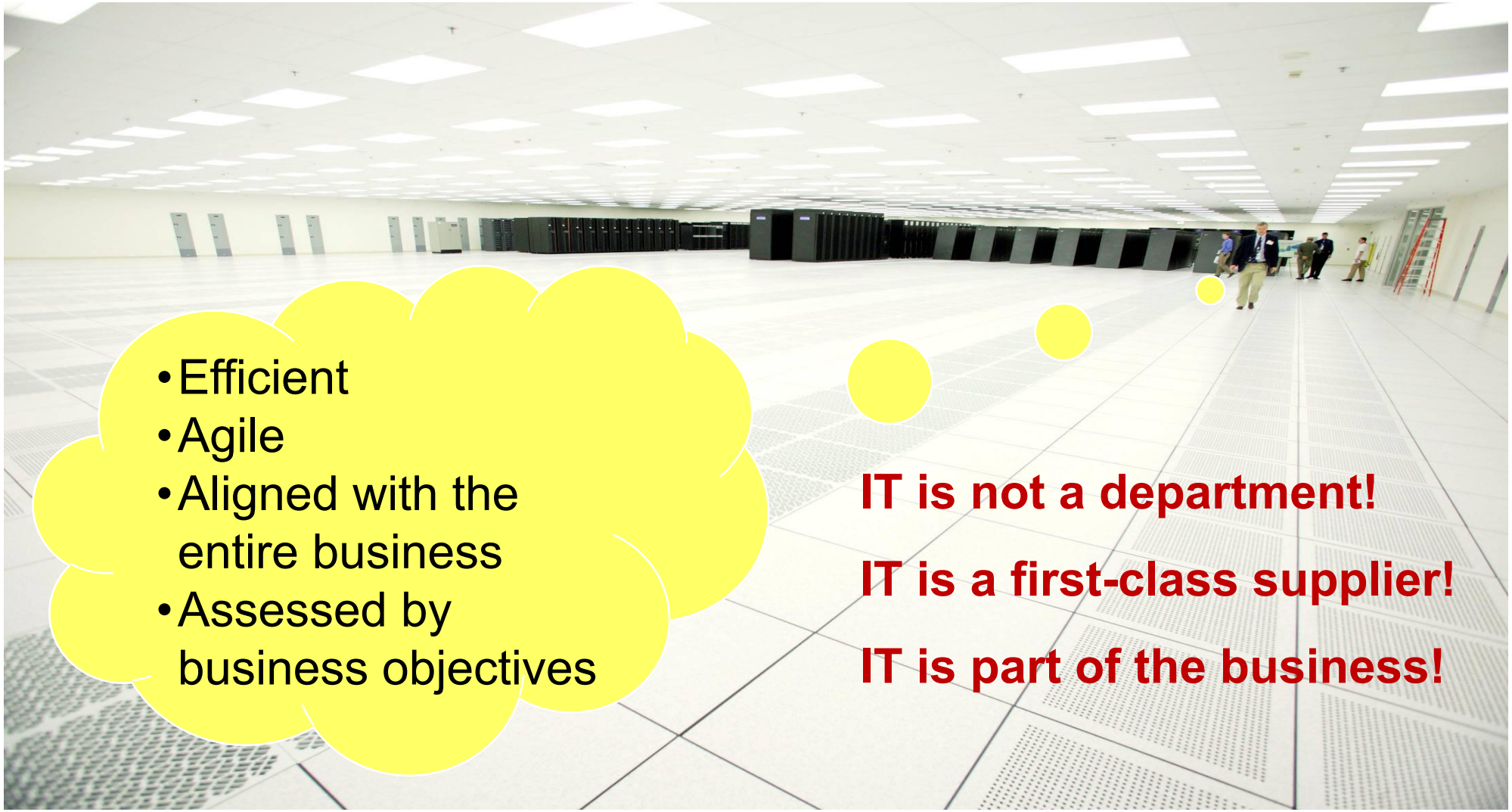
- The world is now changing much fast!
  - faster than anyone/any organization can adapt!
- Evolution in technology
  - is much faster than in biology!
- **IT (Information Technology)** is at the center of it all!
  - Did you know?
- The solution (dos and don’ts):
  - Don’t attempt to fully adapt (technology will outrun you)
  - Specialize/restrict to your core business
  - Subcontract the rest (services)



Services: the way to go in IT



IT is not just for business support



The importance of IT

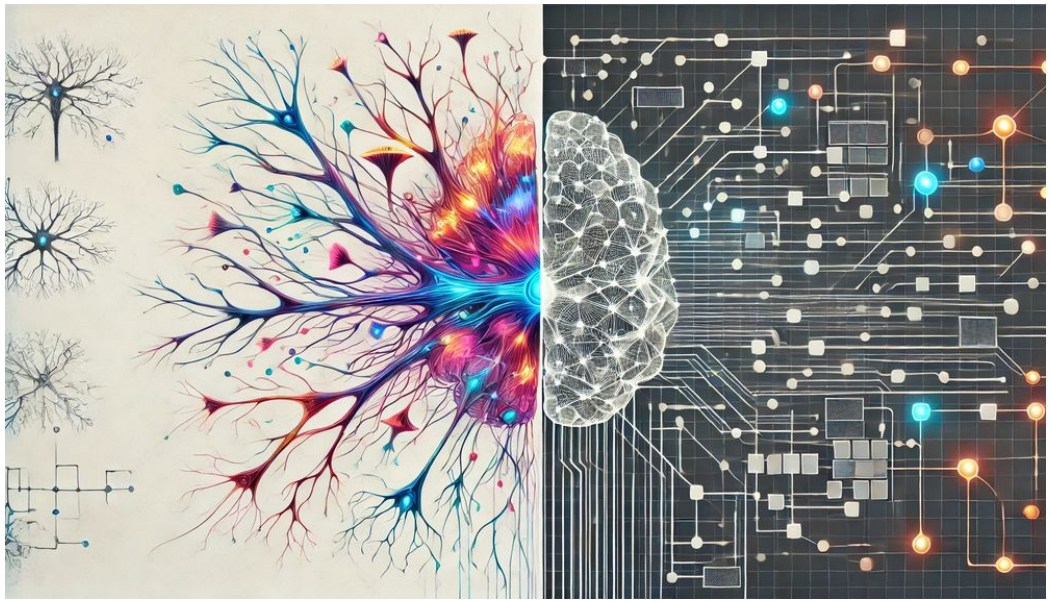
- Enterprises are increasingly dependent on IT
- Examples:
  - Google (the world's largest IT "consumer")
  - Meta (the world's largest user base)
  - Amazon (the world's largest store)
  - EBay (the world's largest mall)
- IT is critical. If it fails, everything stops
  - Reliability
  - Changeability/adaptability
  - Business-IT alignment
  - Specialized training


The social media revolution

- People used to interact face to face
- Now they flock around social networks (Facebook, Twitter, Instagram, Snapchat, LinkedIn, ...)
- There is a social media revolution!
- This is not an absolute merit of social networks. They merely:
  - satisfy a communication need, in an easier and faster way, with tools processing tons of information
  - get providers and consumers together
- All this depends critically on IT

The Generative AI revolution

- ChatGPT
- Claude Sonnet
- CoPilot
- DALL-E
- …

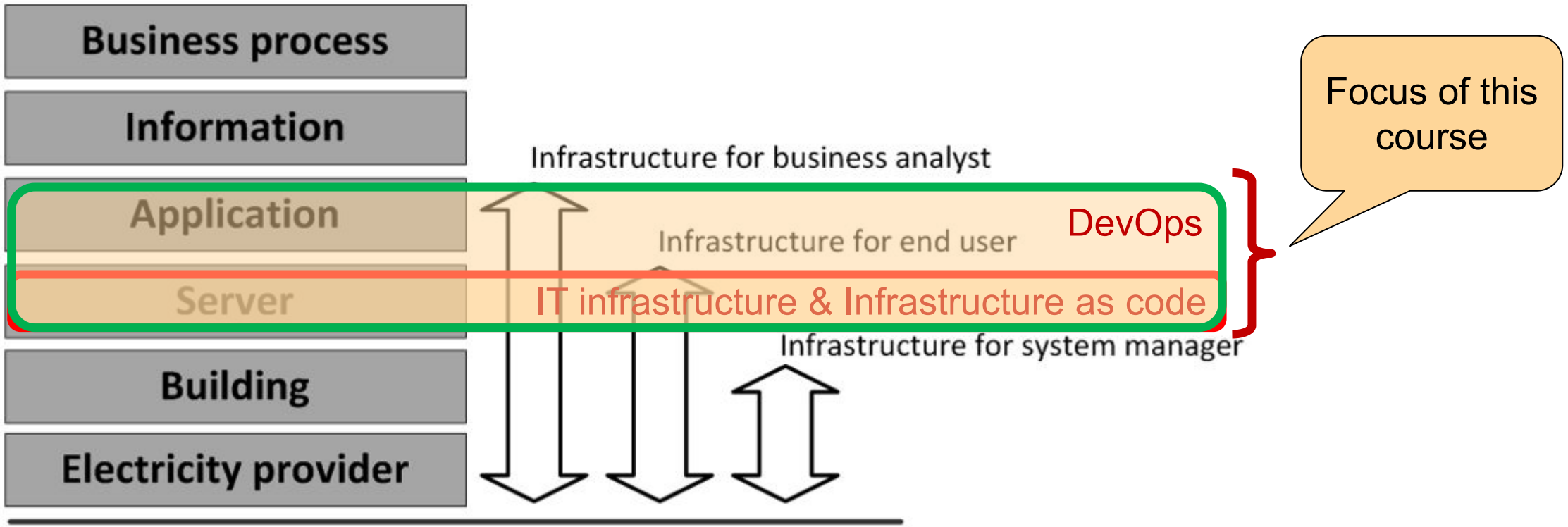


- All this depends critically on IT

An Internet minute in 2024

Source: https://www.pcmag.com/news/gone-in-60-seconds-heres-what-happens-on-the-internet-every-minute

Layered infrastructure model



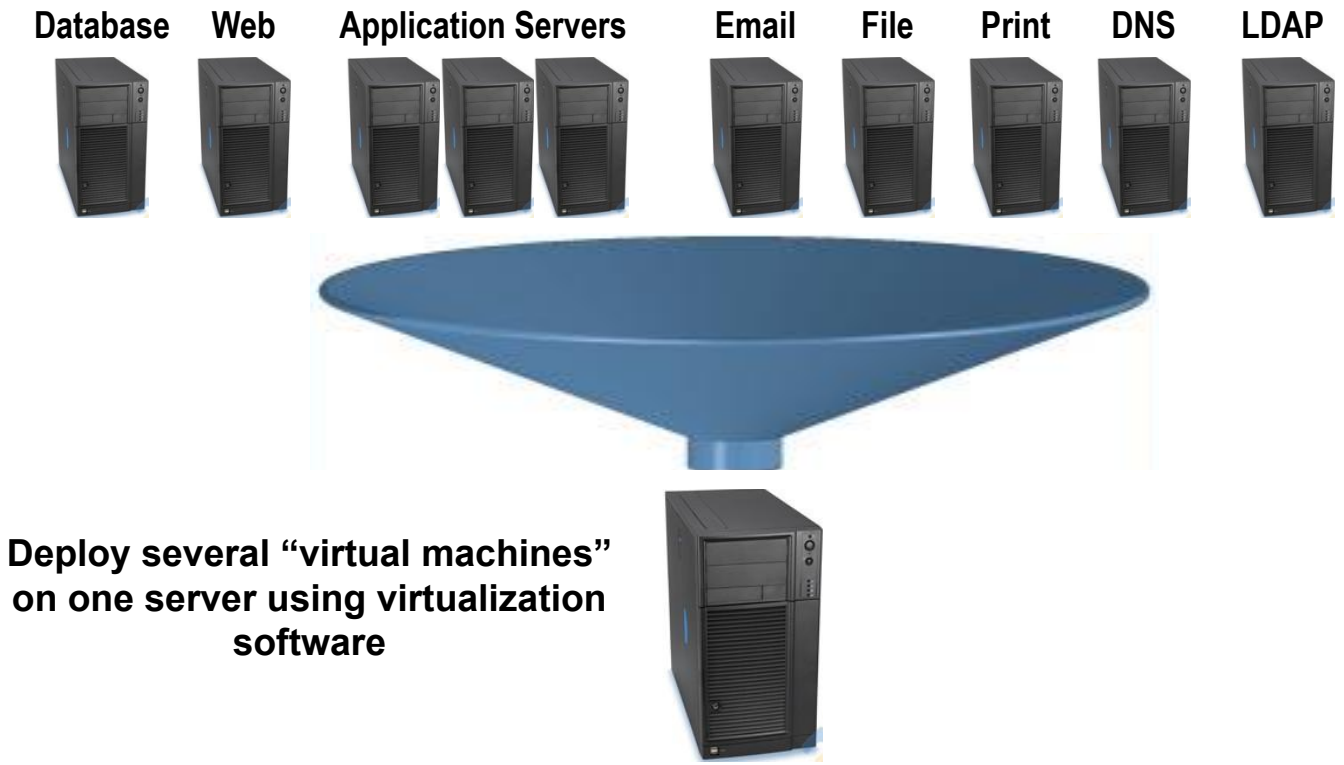
- Infrastructure: foundation layer
  - Use functionality
  - Ignore details
- IT infrastructure provides services to applications

Syllabus

- Virtualization
- Infrastructure-as-Code
- Cloud Computing
- Deployment and Orchestration
- Cloud Native Applications
- Serverless
- ML Systems and MLaaS
- DevOps

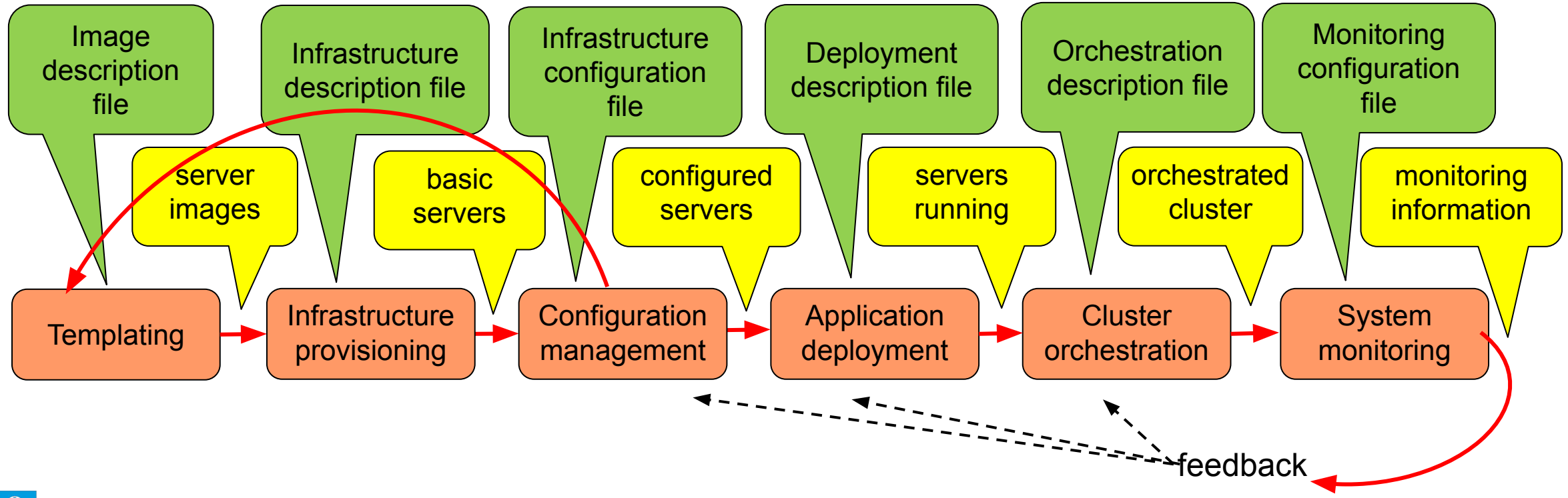
Syllabus

- **Virtualization**



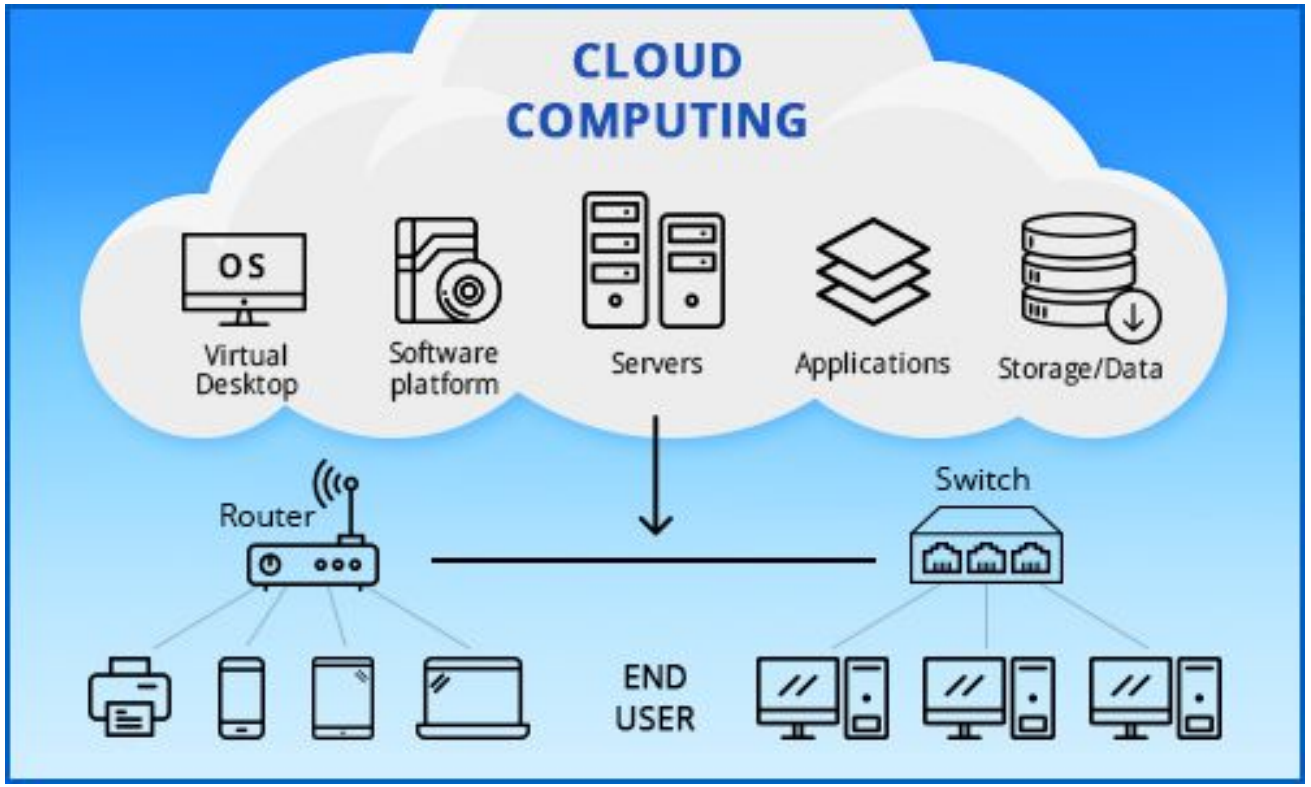
Syllabus

- Virtualization
- **Infrastructure-as-Code**



Syllabus

- Virtualization
- Infrastructure-as-Code
- **Cloud Computing**



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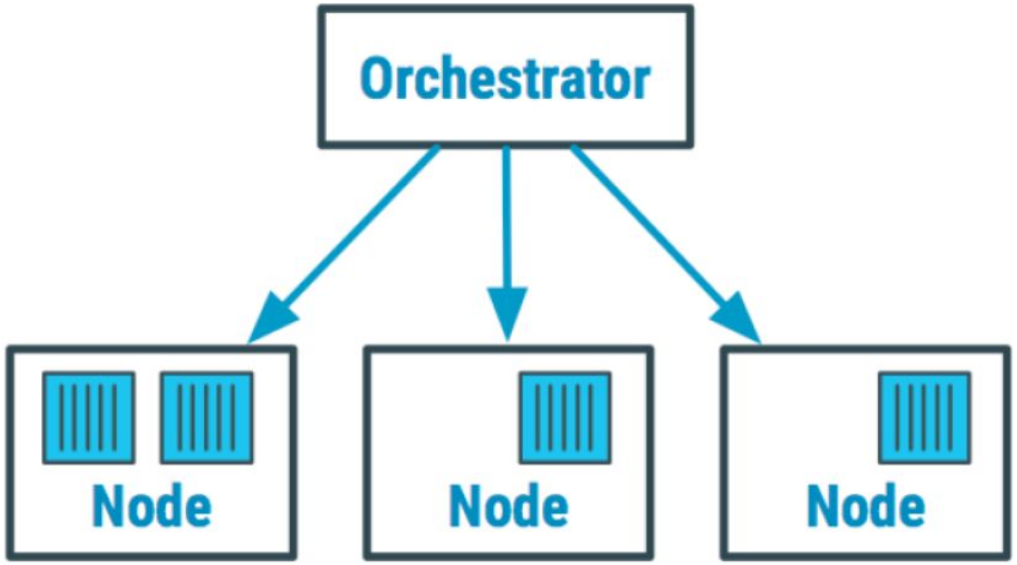
- **Deployment and Orchestration**



Syllabus

- Virtualization
- Infrastructure-as-Code
- Cloud Computing
- Deployment and Orchestration
- **Cloud Native Applications**

Syllabus

- Virtualization
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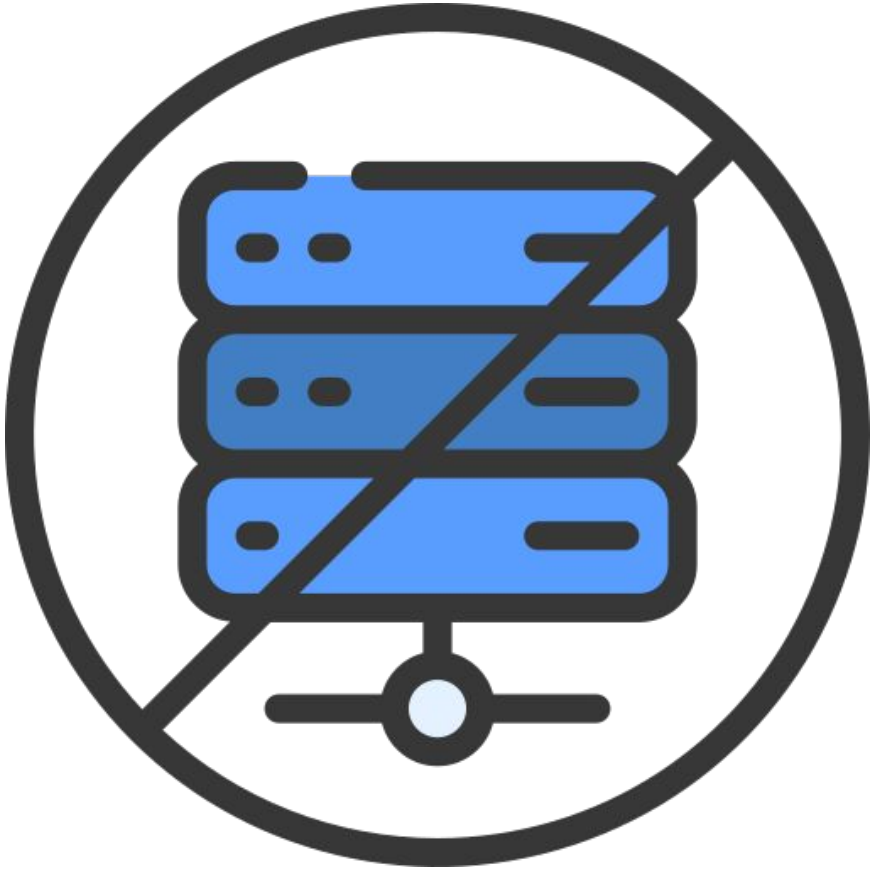
- Cloud Computing
- Deployment and Orchestration
- Cloud Native Applications
- **Serverless**



Syllabus

- Virtualization
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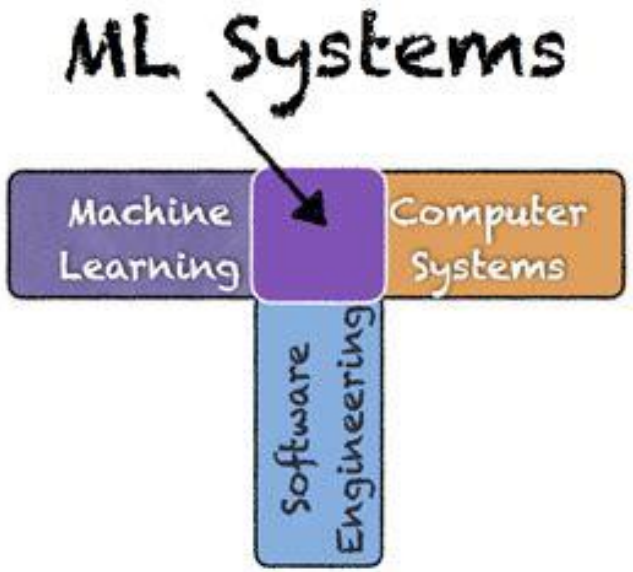
- Cloud Native Applications
- Serverless
- **ML Systems**



Syllabus

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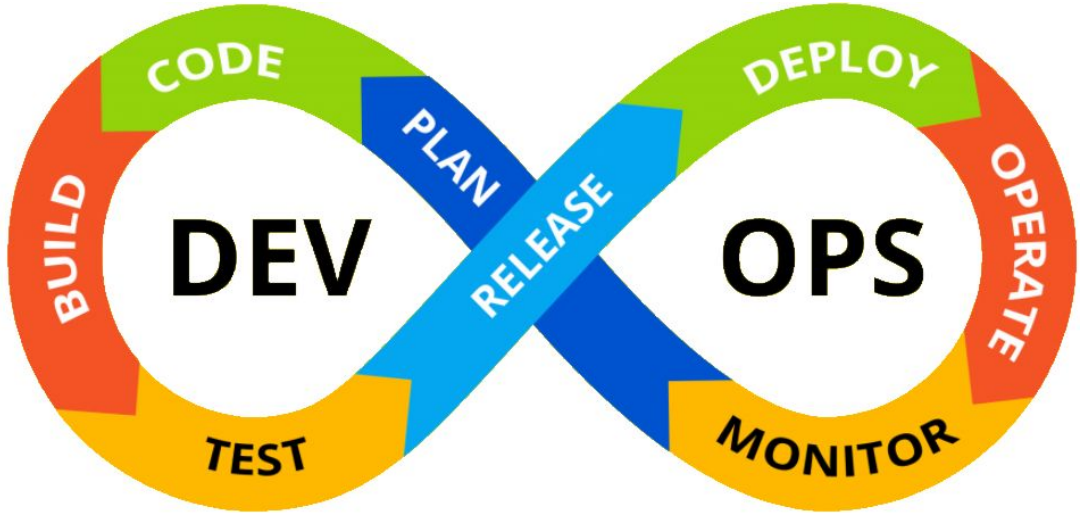
- Cloud Native Applications
- Serverless
- ML Systems
- **DevOps**



Course Work and Evaluation

- Lab component (50%, >= 9.5):
  - Hands-on lab tutorials to be done in **group**
  - Weekly set questions about the lab and lectures; to be done **individually**
    - Week 1: doesn't count for evaluation
    - Weeks 2-6: average of the best 4 grades
    - Week 7: no evaluation, project support only
    - Answers must be submitted by the end of the current week using **Moodle**

- Project component (50%, >= 9.5):
  - Goal: build "A Scalable and Elastic Microservices-based Web Application in a Public Cloud"
  - Technologies: Terraform, Ansible, Prometheus, Grafana, Kubernetes, etc
  - Deliverables: **report, video, code**
  - Project description published by Sept. 7th. Final submission by **Oct. 24th**

Groups for Labs and Project

- Group registration opens on Monday, Sept 8th, at 18h00 (create groups ASAP!)
  - via Fénix, groups of 3
- Registration of groups of 2 students is possible (not recommended)
  - via Fénix, opens 24 hours later (Tuesday, Sept 9th, at 18h00)
- Registration of groups of 1 student is possible (not recommended at all)
  - send us an email, case by case, only after Wednesday, Sept 10th, at 18h00
- Looking for group elements? Use Discord
- Lab classes start this week
- Tutorials will be published one week before the lab
  - **lab classes should not be used to solve the tutorial**
    - but instead, to get help dealing with problems you had solving it!

Gitlab, Moodle, and Discord

- Labs and project description:
  - https://gitlab.rnl.tecnico.ulisboa.pt/agisit/agisit25
  - Login using Fénix credentials ASAP
- Lab assignments:
  - https://moodle.dei.tecnico.ulisboa.pt/course/view.php?id=6726
- Course discord available at
  - https://discord.gg/CurbxqjcDA

Thank you! Any questions?