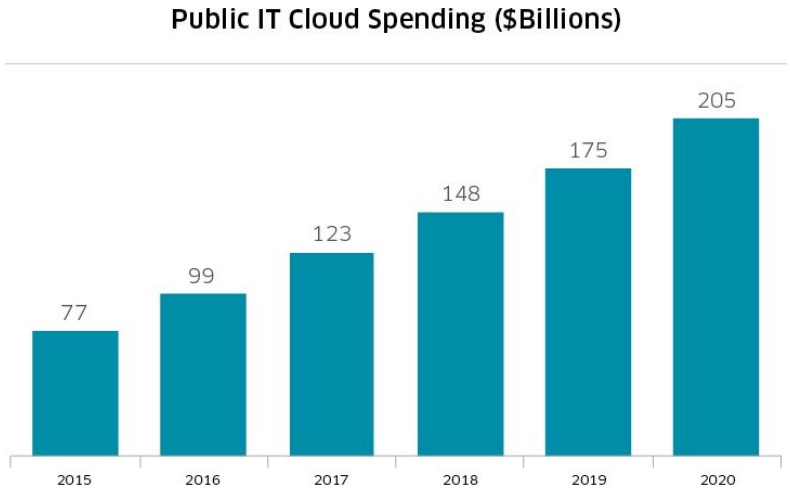
A Short Introduction to Cloud Computing

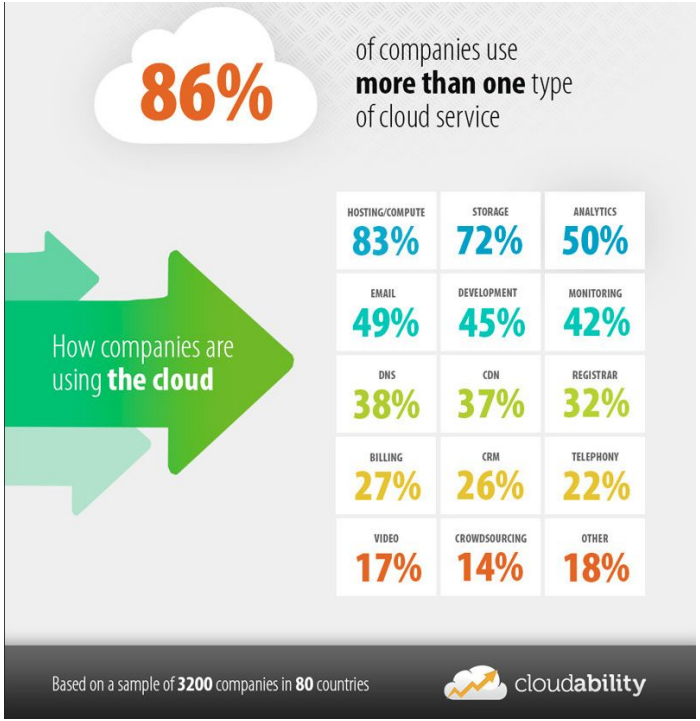
ir. Laurens Versluis
l.f.d.versluis@vu.nl
https://atlarge.science

VU VRIJE UNIVERSITEIT AMSTERDAM

Cloud popularity and usage at all-time high

- Surveys: 86% of companies use >1 cloud service, >$200B market by 2020
- Cloud computing increasingly important
  - Improve competitive position for a company
  - Reduce costs for company & customer

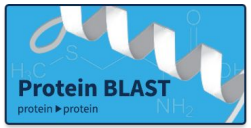




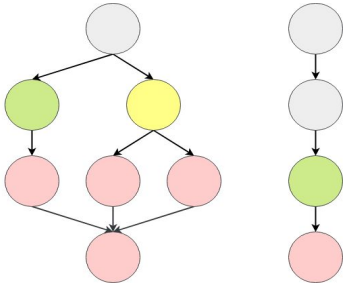
Source: http://business.nasdaq.com/marketinsite/2017/Cloud-Computing-Industry-Report-and-Investment-Case.html

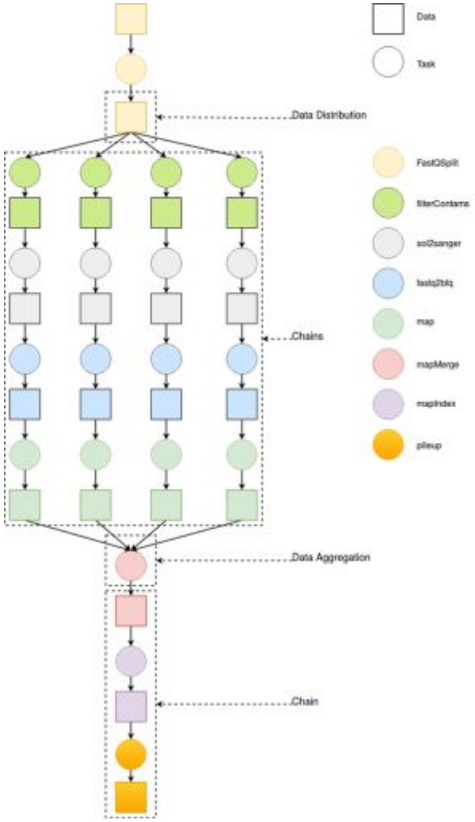
Workflow execution is common

- Workflows = set of tasks with precedence constraints
  - Usually represented as a Directed Acyclic Graph (DAG)
  - Used to model applications in many domains
- Today: thousands of applications in use



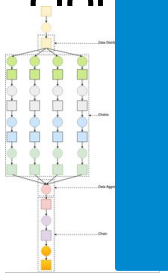
finding cancer early
epigenomics





Executing workflows in the cloud

1. Wor
clou
heir



On which resource do we execute the workflow?

How many resources to acquire and when?

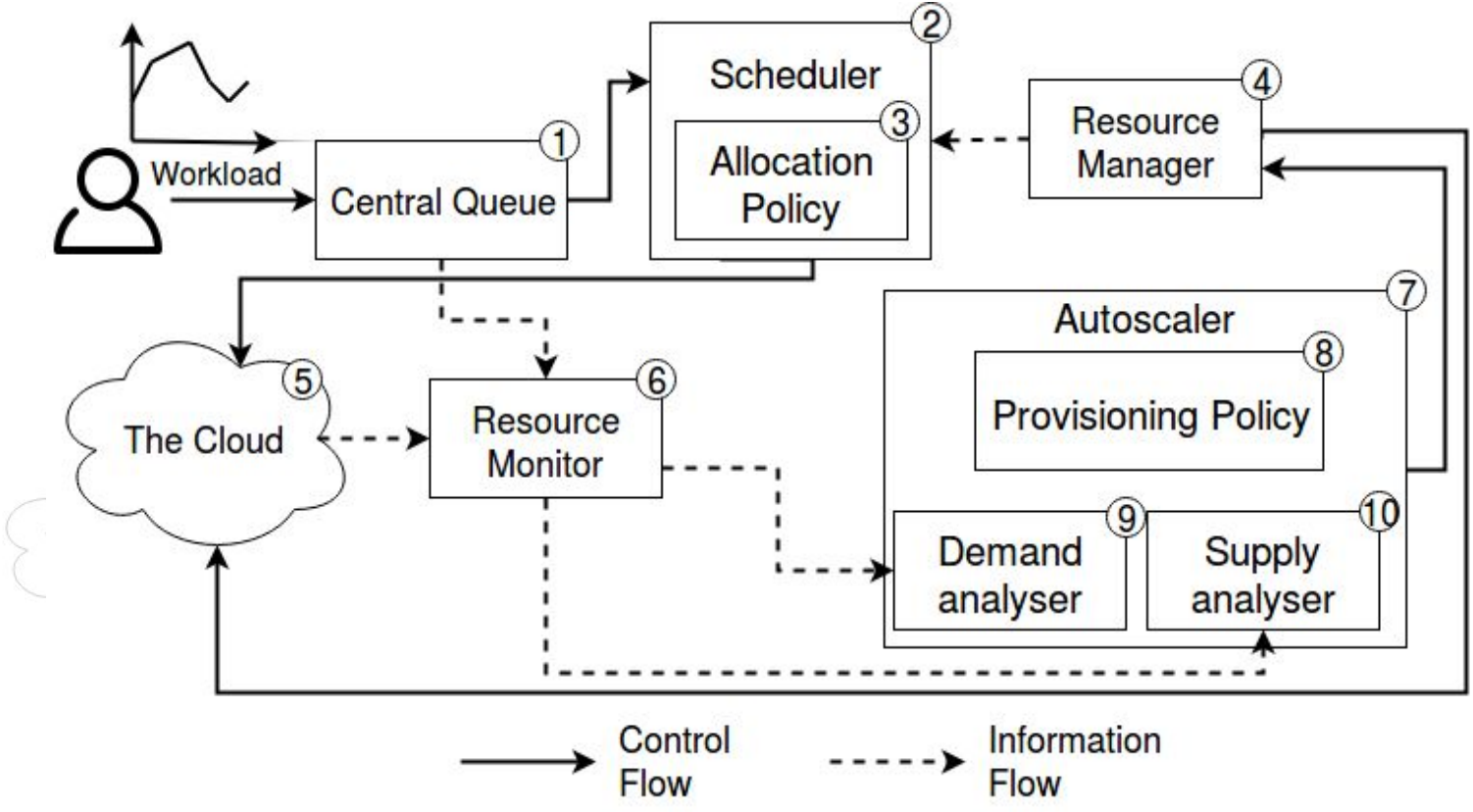
Workload of workflows

A problem for cloud providers

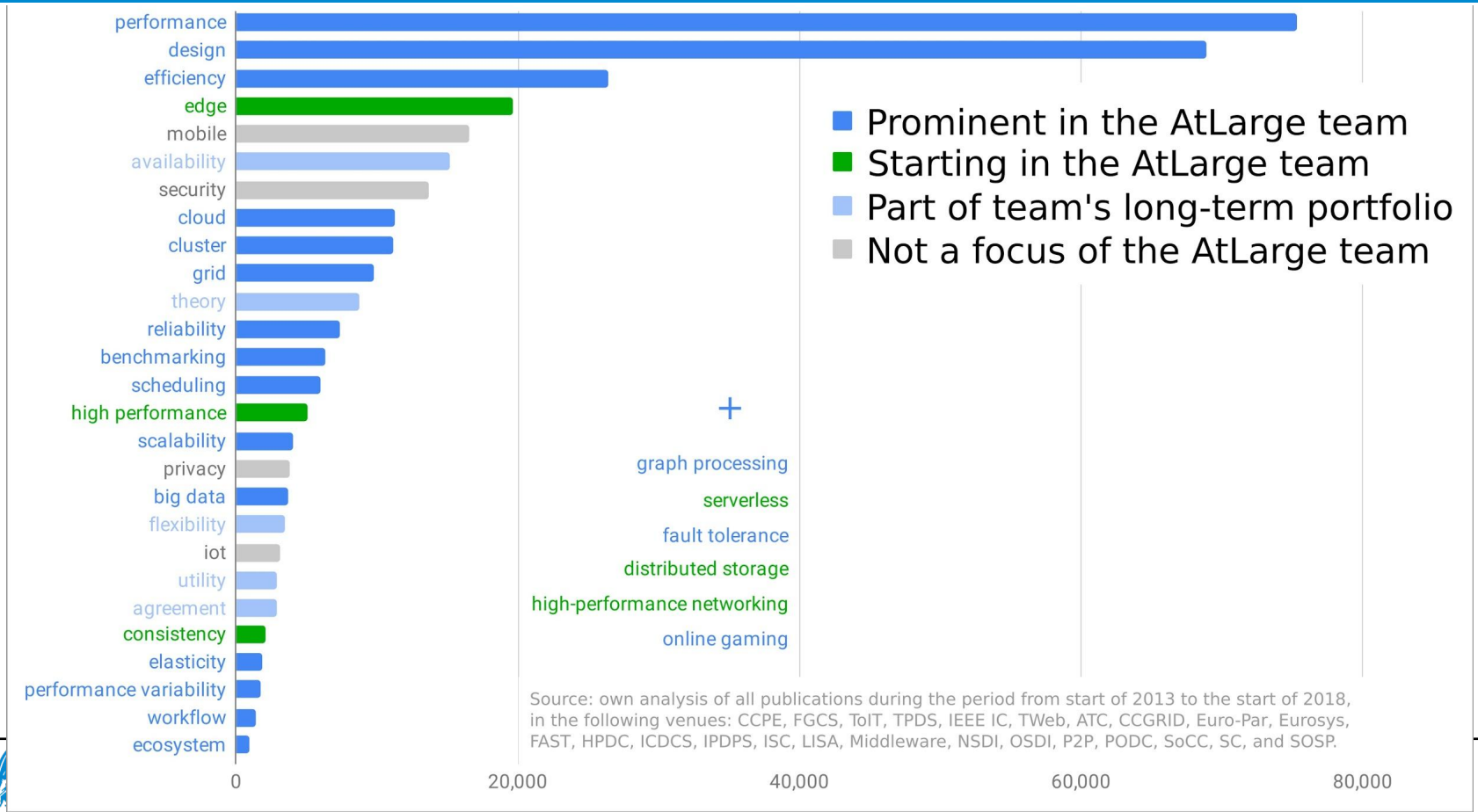
Cloud providers preferably want:

1. (Close to) optimum workflow allocation
2. Minimize overprovisioning (allocating too many resources)
   - ➢ Reduces costs
3. Adhere to the Quality-of-Service (QoS) requirements of the client
4. Automate this process
   - ➢ Poor user estimates of resource requirements

Overview of a workflow management system



We are actively working on these topics



Wrapping up

Scheduling in clouds, a complex problem:

1. Allocation (where to put tasks)
2. Provisioning (when to change resources)

@Large is actively working on these topics.

Interested in this work? Feel free to contact me/us!

A Short Introduction to Cloud Computing

ir. Laurens Versluis
l.f.d.versluis@vu.nl
https://atlarge.science

VU VRIJE UNIVERSITEIT AMSTERDAM