

Universidade Vigo



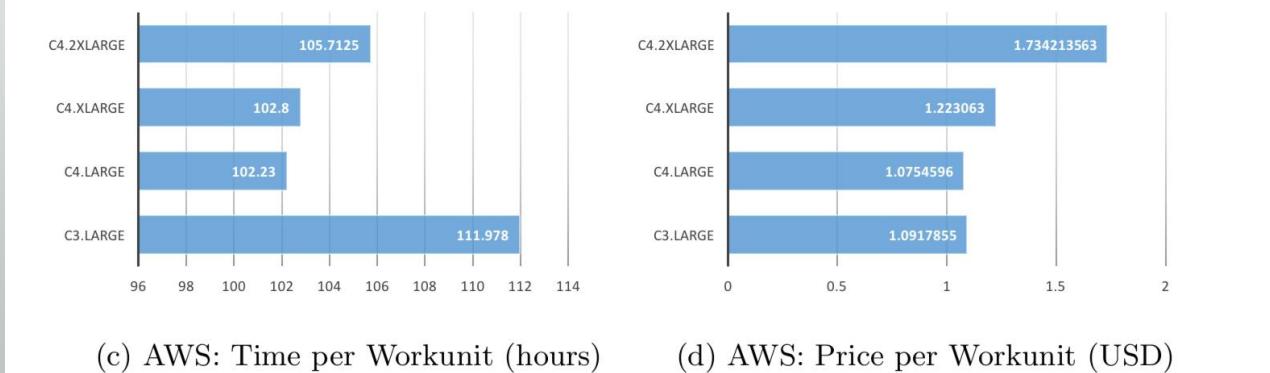
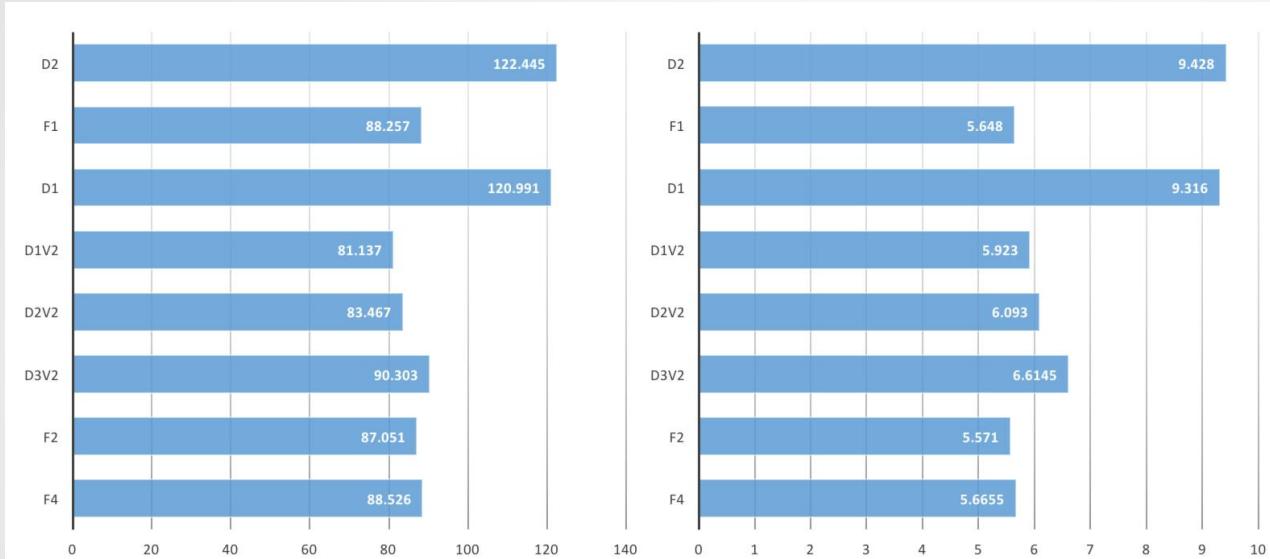
Use of several Cloud Computing Approaches for Climate Modelling: Performance, Costs and Opportunities

Perez Montes, D. A., Añel, J. A., C. H. Wallom, D., Arribas, A., Uhe,
V. Caderno, P., F. Pena, T.

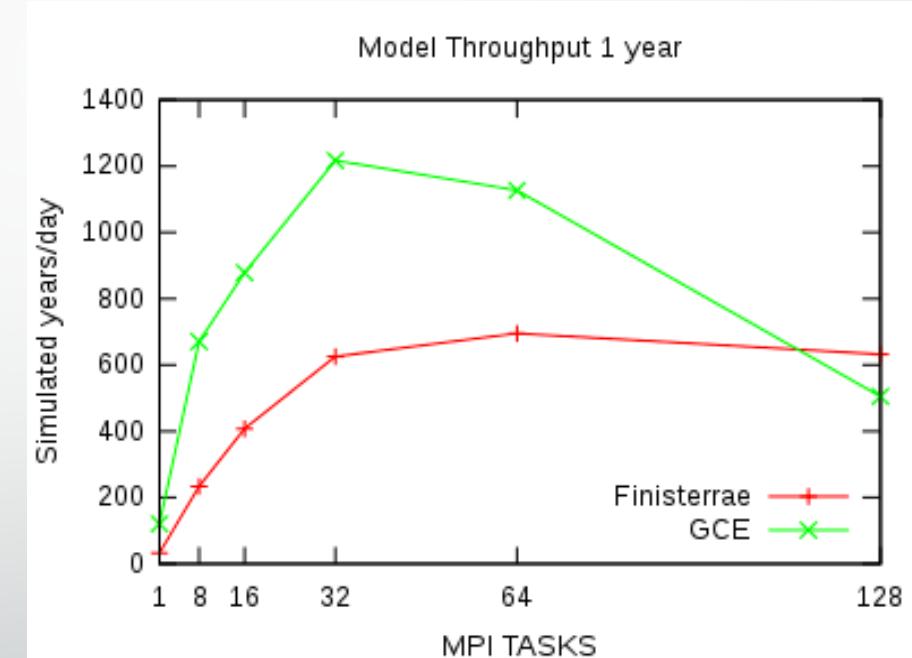
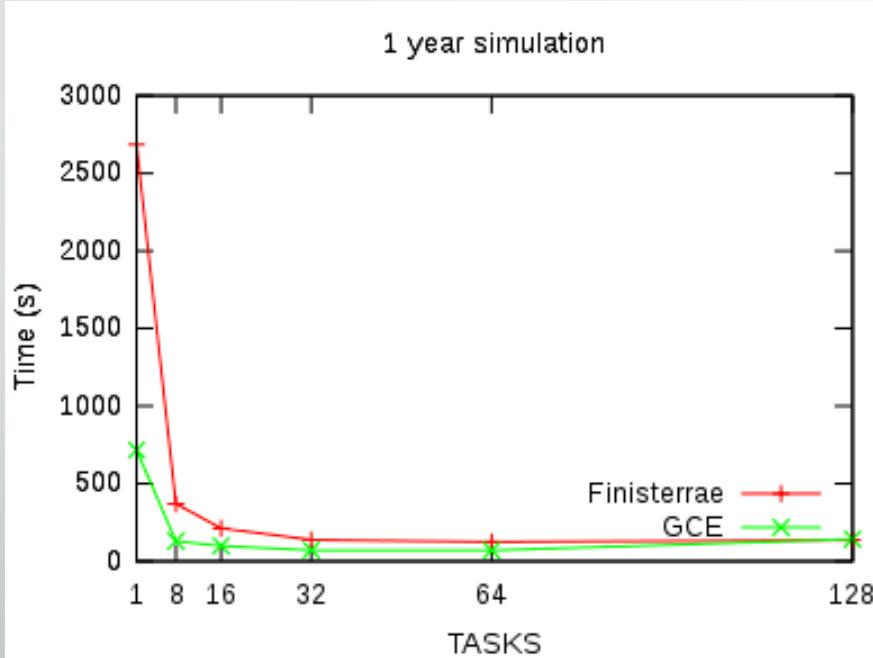
Cloud Computing for Atmospheric Sciences

- Most of the current simulations are ran on HPC environments.
- Cloud Computing can allow scientists to dynamically (and on-demand) get a high volume of computing resources.
- Some experiments are already on the cloud (e.g. UK Met Office).

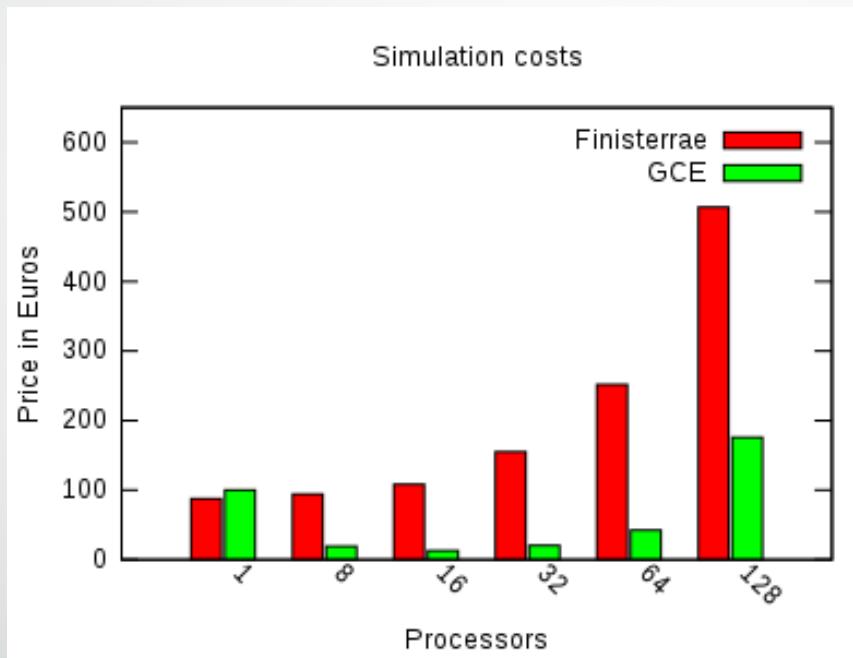
Possibilities Evaluation: Experiments on Different Providers – AWS vs Azure



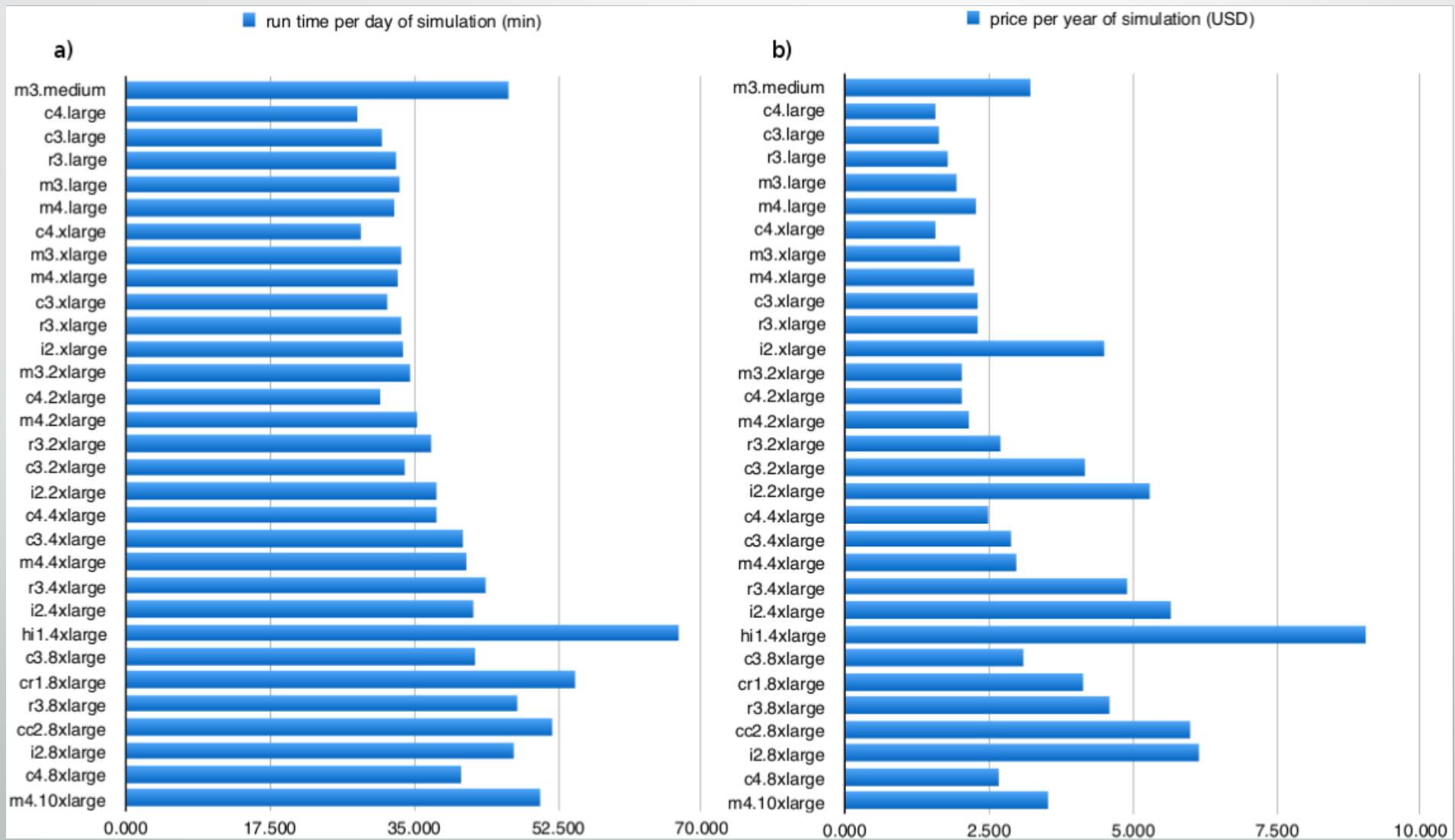
Possibilities Evaluation: Experiments on Different Providers – GCE vs FT



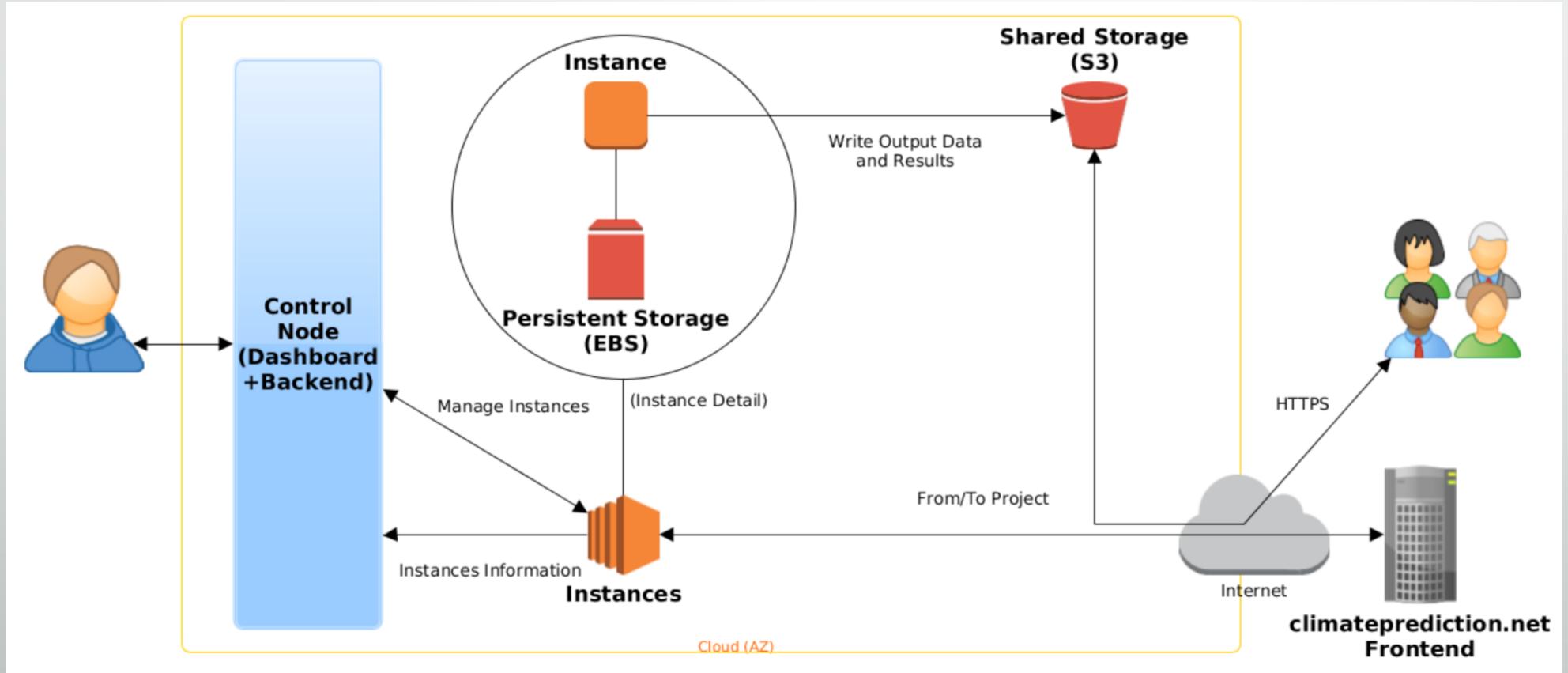
Possibilities Evaluation: Experiments on Different Providers – GCE vs FT



CPDN on the Cloud



CPDN on the Cloud



Funding Research on Cloud Computing

- Moving from HPC to Cloud also moves the need to get funding (private providers).
- Paying for automated work that on a SuperComputer environment is traditionally done manually (reducing toil for engineers and scientists).
- A boost on Cloud Computing is expected over the next years.

Security on the Cloud

- Perception that in-house solutions are “safer”.
- Cloud providers meet the industry standards and certifications.

Security on the Cloud

- For Climate Research it is essential not to have data tampering.
- Blockchain technologies are a potential solution.

Conlusions

- Experiments are moving towards a IaaS or HPC as a Service.
- Cloud costs are high, mixed public-private clouds could be a good option.
- Migrations from traditional HPC to Cloud should be carefully studied (costs have a high impact).

References

- Montes et al. (2017) *Enabling BOINC in infrastructure as a service cloud system*, Geosci. Model Dev., doi:10.5194/gmd-10-811-2017
- Añel et al. *Clouds as a solution*. (submitted to Bull. Am. Meteorol. Soc.)