PhD Open Days

Lynceus: Long-Sighted, Budget-Aware Online Tuning of Cloud Applications

Dual PhD Program CMU-Portugal in Software Engineering

Maria da Loura Casimiro (maria.casimiro@tecnico.ulisboa.pt)

INESC-ID, Instituto Superior Técnico, Universidade de Lisboa



Problem

Lynceus

- Many enterprises run jobs on the cloud
- There are hundreds or even thousands of virtual machine types
- Finding the right combination of VM type, cluster size, and parameter settings for the job is a non-trivial task.





- Build an algorithm to jointly optimize:
 - The number, type and size of cloud resources
 - The tuning of application specific parameters
- Minimize overall cost while ensuring QoS constraints
- New tool to provision and tune jobs on the cloud
- It does so automatically and in a cost-efficient manner
 - Implements a new long-sighted, budget-aware approach





90-th percentile of the Cost Normalized w.r.t. Optimum (CNO) and Average Number of Explorations (NEX) for Lynceus and BO.

90-th percentile of the CNO achieved by all variants of Lynceus and BO, as a function of the NEX performed. The green stars mark the average number of explorations performed.

Lynceus outperforms BO regardless of the available budget

Lynceus finds configurations closer to the optimum

This work was supported by national funds through FCT - Fundação para a Ciência e a Tecnologia with references UID/CEC/50021/2019 and PTDC/EEISCR/1743/2014.



Supervisors:

Paolo Romano, David Garlan

Dual PhD Program CMU-Portugal in SE

phdopendays.tecnico.ulisboa.pt