

# Ambientes Virtuais de Execução / Virtual Execution Environments 2013/2014



## Época Especial - Project

[MEIC-A / EMDC](#)

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### Project Scope

The overall goal of the AVExe project is to perform a study on an open-source virtualization technology. It encompasses Analysis of Internal Mechanisms, Relevant Evaluation and Extension of a selected open-source VM.

**Deadline for submission: Monday, July 29th, at 23h59m, mail to [luis.veiga@inesc-id.pt](mailto:luis.veiga@inesc-id.pt).**

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### Project Document Structure

1. **Overview (Introdução)** : state briefly the main information about your project proposal. This will describe the technology used, its type, typical usage, your own motivation (be welcome to browse "wishlists" of open-source projects), internal mechanisms subject to study, and the major activities of your work.

2. **Virtualization Technology and Internal Mechanisms Studied:**

**High-level Language VMs:** suggested VMs: Lua VM, JamVM since they have very small code base.

**Internal Mechanism to Study:** garbage collection algorithm and memory management. Identify and explain, with reference to the code base, how the following mechanisms is implemented, and the design decisions it follows:

3. **Project Approaches: Analysis of Mechanisms and Implementation**

**Evaluation:** performance analysis and benchmarking of the garbage collection behavior.

i). design micro-benchmarks that exercise the behavior of the GC, that assess the performance criteria of GC taught in the lectures:

ii). These can be guest code (Lua or Java). No changes to the VM are required although they are valued if help to get more detailed measurements.

iii). Metrics to assess: a) full and partial collection time, b) object allocation time, c) object access time, d) memory efficiency (fragmentation and co-locality).

iv). Possible patterns to address: explore different object populations and behaviors, e.g. a) average object size, b) average object lifetime, c) object allocation rate and garbage creation rates, d) density of references among objects.

v). Describe your approach, based on the findings of 2), to the design of the benchmark code and main design choices, full code left for appendix.

4. **Evaluation Results:**

Describe and analyze your findings, qualitative and quantitative results and offer discussion and evaluation for the current implementations.

5. **Conclusion**