Project Goal: our goal is to extend the state of the art in regards to measuring and characterizing the performance of the operating system, in relation to application, hypervisor, hardware, and interrupts.

Project Groups: projects will be done in groups of 2-5 students.

Project Meetups: project groups should meet weekly

Key Dates:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Nov 4, 21 Dec 2</td>
<td>Progress Reports due electronically</td>
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<tr>
<td>Wed Dec 14</td>
<td>(final exam time slot) Project Presentations</td>
</tr>
<tr>
<td>Sat June 14 (11:59pm)</td>
<td>Individual Emails Due</td>
</tr>
<tr>
<td>Sat June 14 (11:59pm)</td>
<td>Project Reports due (Version 2 complete)</td>
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Project Deliverables:

- First meeting: outline the approach, a list of tasks each person is working on, a plan for group meetings, and a description of the platform and software that will be used. Outline what will be included.
- Progress reports describe the progress, any issues/questions, and a plan for the remaining work.
- Final Report is a technical paper describing the work done, demonstrating the results, and a discussion section. The report follows the same format as a technical paper, including proper reference formatting. There is one final report per group.
- Individual email is a short email from each individual listing what group you are in and what particular part of the work you did.

Project Grading:
Each person will receive an individual grade.
Virtualized Server Performance

A Interference
This group will conduct an External interference study (measuring application performance effects caused by other VMs). This includes designing and setting up the study, including selecting the workload application(s) and installing them. You will deliberately drive up the resource consumption of a VM so that it interferes with the VM you are measuring. The goal is to allow an application running in a VM to be informed of external interference.

B Studying the overhead of system calls - Xen
This group will conduct a comparative performance study between Xen and a native Linux system, to measure and compare the overhead of system calls. This includes designing the study, including selecting the workloads and possibly installing needed software.

C Studying the overhead of system calls – Containers
This group will conduct a comparative performance study between containers and a native Linux system, to measure and compare the overhead of system calls. This includes designing the study, including selecting the workloads and possibly installing needed software.

D. Survey Paper

This project is a paper only and does not require any hands on programming. You will search the literature and write a survey paper (aka “annotated bibliography”) on this topic: OS-level security exploits, detection, and correction in virtualized systems.