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**Bâtiment Ter@tec
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NUMAPROF, A NUMA profiling tool

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Nowadays most of the HPC servers are NUMA (Non Uniform Memory Access). It was true with the usage of multiple CPU in the same server and is now true inside the CPU itself like for the Intel Knight Landing when configured in SNC2 or SNC4 mode. To extract performance on such architecture, multi-threaded applications need to be NUMA-aware and explicitly take care of the memory placement of their data. Although, current operating systems like Linux make the memory placement done via the first touch policy. This implicit semantic makes mistakes silently slowing down applications.

In order to check the memory placement I built NUMAPROF. The tool is based on Pintool to instrument applications and intercept all their memory accesses. It then provides a profile pinpointing the unpinned, local, remote and MCDRAM memory accesses into a web-based graphical interface by annotating the source code. Metrics are reported on the call site and on the allocation site to quickly find misplaced segments. It also provides the first touch instructions to know where the memory has been placed. I will present the tool and some examples.

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