



Kickoff AE Multicore

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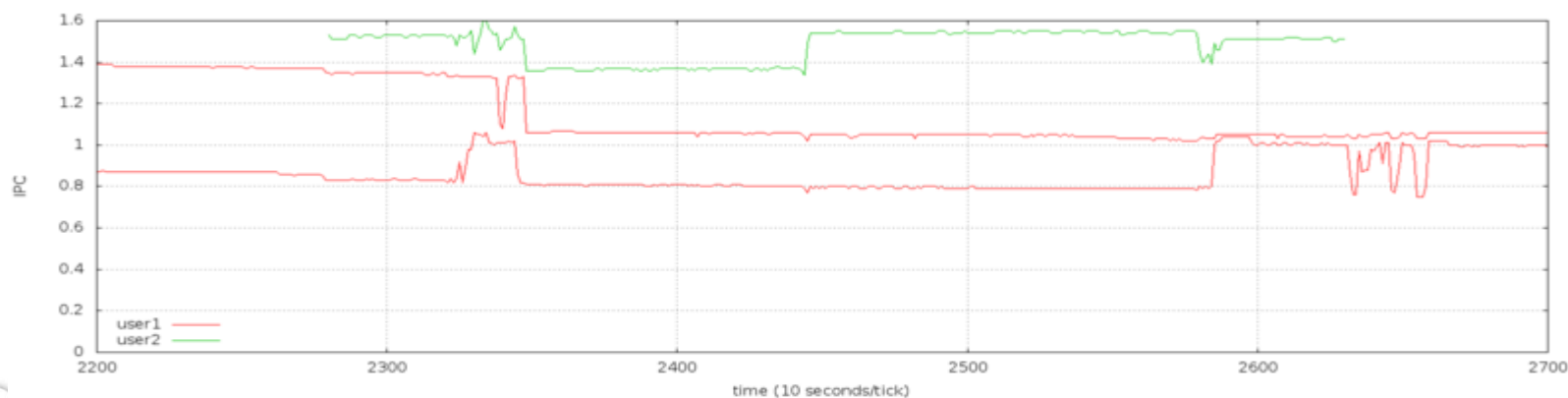
9 Apr 2013

Dynamic parallelization and optimization of binary code

- PhD, co-advised by Ph. Clauss and E. Rohou
- Started 15 Feb 2013
- Nabil Hallou (M2R Grenoble)

Dynamic Adaptation

- Legacy code
 - e.g. Fedora 14 targets PPro (no MMX)
 - commercial app/library (no source)
- Grid/cloud: unknown hw
 - target the least capable
- Cloud environment
 - unknown competitors for resources
- Whatever just not done by static compiler



How?

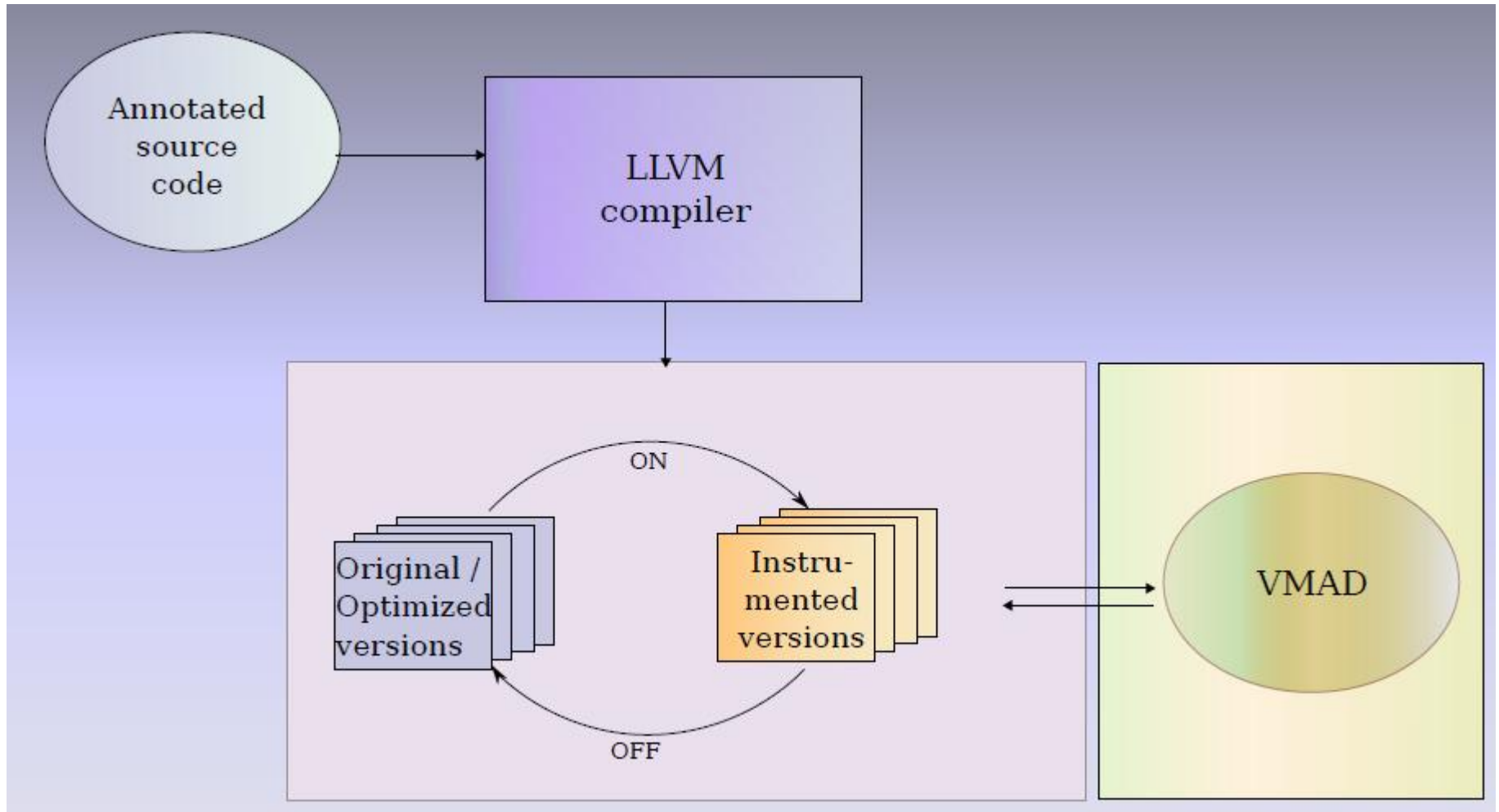
Three different approaches will be investigated:

- binary to binary: *in situ* patching.
- binary to IR to binary:
 - LLVM
 - possibly leveraging also qemu, MinIR?
- static binary to IR to binary
 - static analysis before execution,
 - speculative/partial transformations
 - dynamic finalization

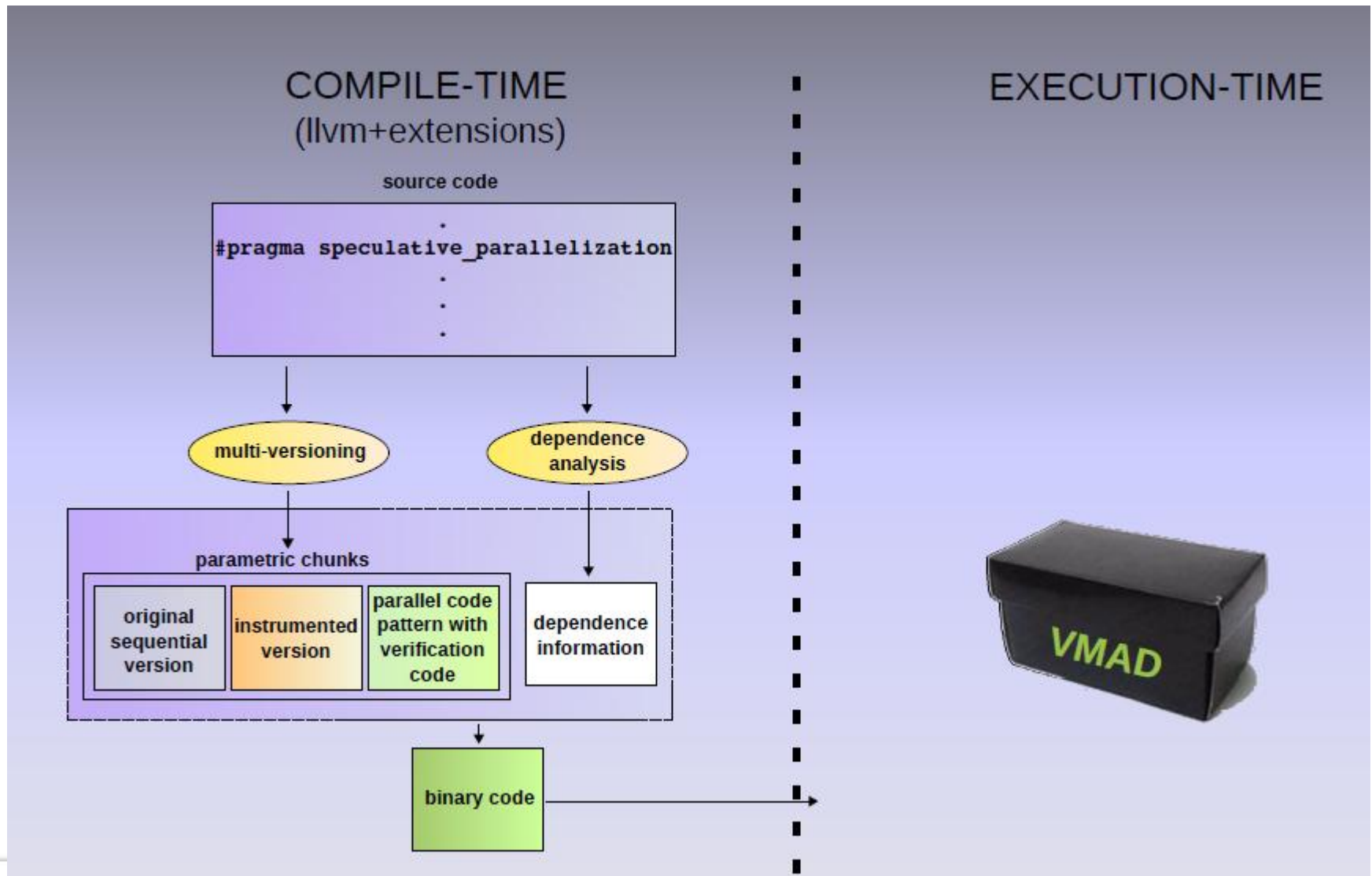
Leverage VMAD

- Developed by A. Jimborean, supervised by Ph. Clauss
 - Speculative parallelization
 - Polyhedral model
- Requires `#pragma` and static transformations

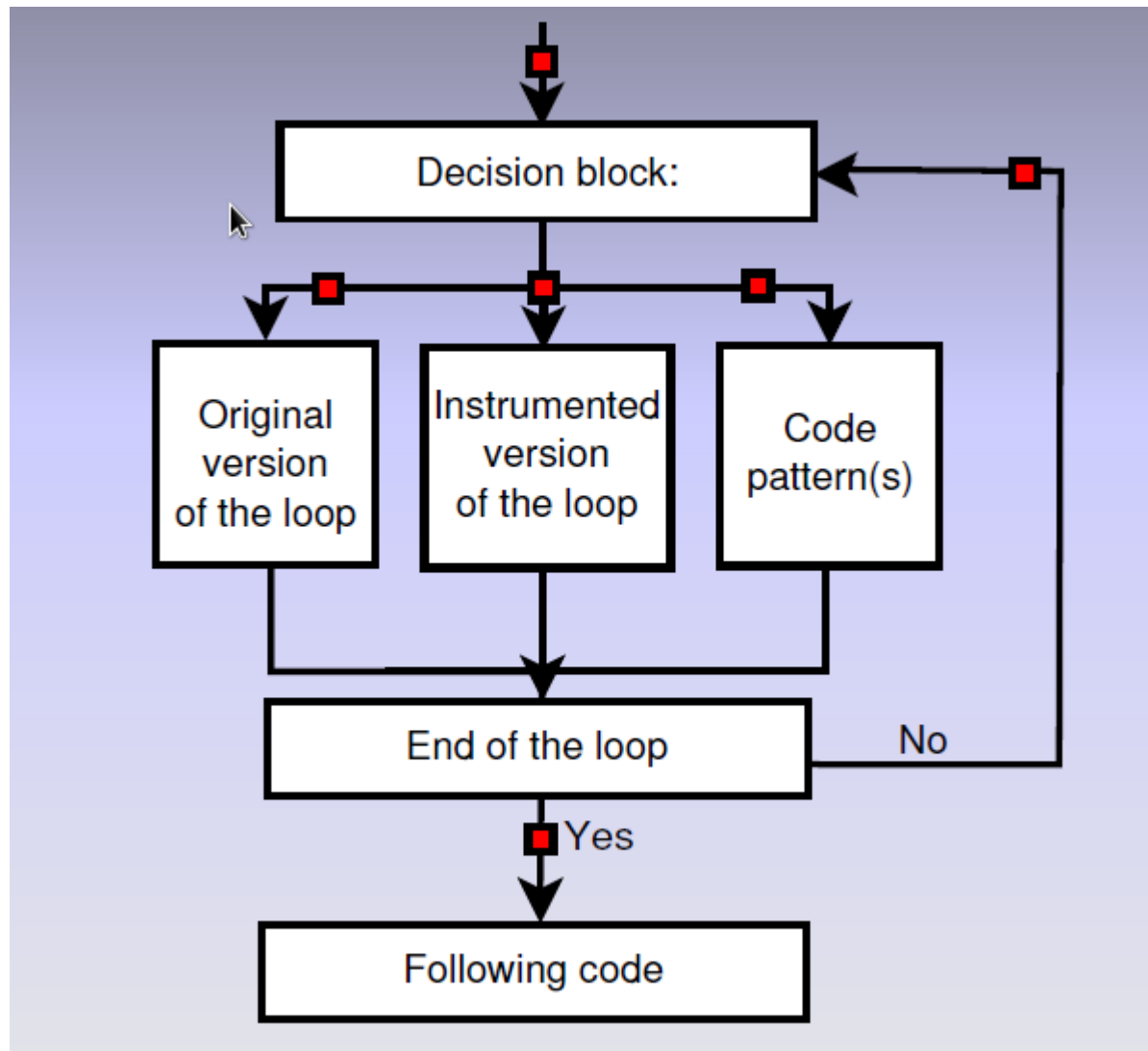
VMAD Framework Overview



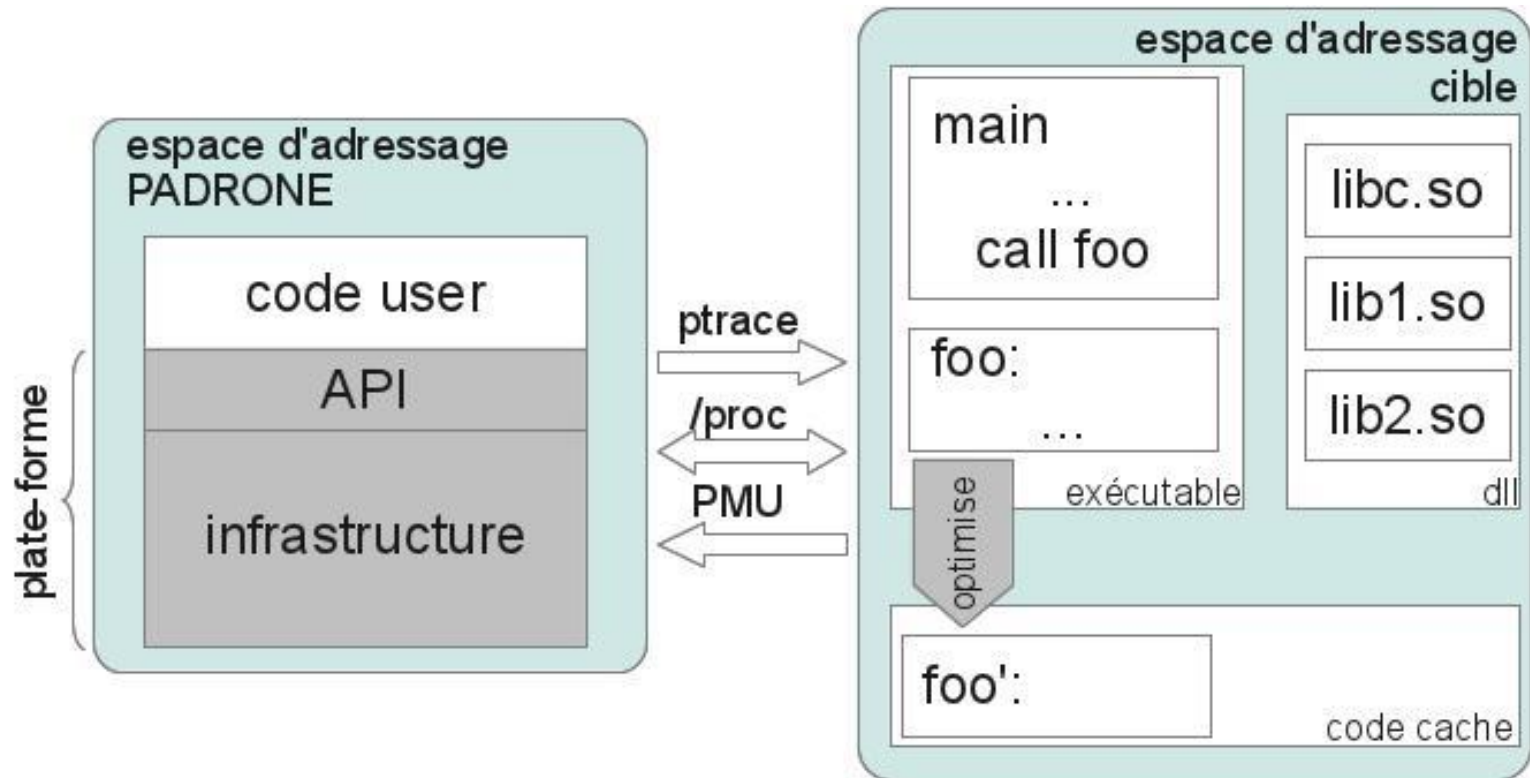
VMAD Compile Time



VMAD Multiversioning



ADT Padrone



Platform

- From “outside”, gdb-like
 - less interference, transparency problems
 - focus on hot regions only
- Analysis
 - sampling
 - instrumentation
 - hardware counters (PMU)
- Transformation
 - probe mode
 - JIT mode

Status ADT

- Engineer since November 2012
 - Emmanuel Riou
 - 10 years experience
- Platform profiling capability starts working
- Preliminary basic transformations (cloning)