OCamlot: OCaml Online Testing
State for the Open Source OCaml Community

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OCamlot: OCaml Online Testing

The Quality Quality

A Typical Typist

The Cybernetic Curator

Just Representation

To Avalon
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A Caml on Every Core

- Consistent results ("It Just Works")
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- Obvious solutions ("What have I forgotten?")
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- Addictive actions ("I want to install more software.")
- Quality functions ("Just what I wanted.")
Universal Concerns

- Compiler hypotheses
  - New injectivity restriction is minimally disruptive
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- Build system hypotheses
  - Compiler commands can be diverted

OPAM 1.1 is stable

Packages silent on OS/arch dependency can build and run everywhere
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- Environment hypotheses
  - Packages silent on OS/arch dependency can build and run everywhere
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Evaluating the future

- Typical typist makes pull request to repository
- Curator observes proposal
- Hypothetical consequences evaluated
- Potential amendments proposed
- Repository administrator signs with 1 click
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- E.g.: Weekly Core release
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The Shared Repository Management Game

- **Objective:** promote public health and safety
- **Strategy:** get inside the humans’ loops
- **Loop:** Observe, Orient, Decide, Act
- **Advantage:** scale and heterogeneity
Repository Observation

- GitHub bindings with web hooks
  - Pull Requests
  - Commits
  - Comments
- Pre-build merge
- Other event streams?
Dependency Orientation

- Capabilities with environment dependencies
- Packages with constraint-based dependencies
- Repository with revision dependencies
- Artifact and task interdependencies
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- E.g.: Jérôme Vouillon’s Android OPAM repository
Triage Decisions

- Classify common error modes
  - Unsatisfiable
  - Dependency
  - Transient
  - System
  - Metadata
  - External dependency
  - Build error
  - Multiple

- Judge severity and impact

- Generate amendments to resolve
State Action

- Commit task intention
- Commit build evidence
- Commit error analysis
- Commit proposed amendment
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- Agents negotiate their tasks over HTTPS
- Independent metadata layers for orthogonal aspects
- Persistence to a layer in a branch consistent store
- All byproducts serialized as s-expressions
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- Persistence to a layer in a branch consistent store
- All byproducts serialized as s-expressions
- Branch-consistent stores like Git or Irminsule
Our Present Executive

- Observation available and active
- Orientation minimally prototyped
- Basic triage heuristics complete
- No amendments
- Ephemeral task system (commit evidence+analysis)
- Simple reactions
History So Far

- Lots of metadata bugs
- Many package bugs
- Some tool bugs
- 30+ x86-64, 30+ x86-32
- 8+ ARMv6, ARMv5tel, PPC, PPC64, Sparc64...
- Multiple Linux distros, FreeBSD, OpenBSD, OS X
- Dead Rpi, panicking *nix filesystems
- Don’t make warnings fatal!
OCaml Online Testing

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- opamfu for DAG analysis + memoization
- Forward migration
- Lower overhead to administer exotic workers
- Advanced automation (amendments, chat bots)
- Better site integration
- Benchmarking
- Universal experiments with differential analysis
- VM-based test systems
  - 500+ on-demand machine instances from Rackspace
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