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

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- Addictive actions ("I *want* to install more software.")
- Quality functions ("Just what I wanted.")

Universal Concerns

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- Build system hypotheses
    - Compiler commands can be diverted
- Package manager hypotheses
    - OPAM 1.1 is stable
- 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
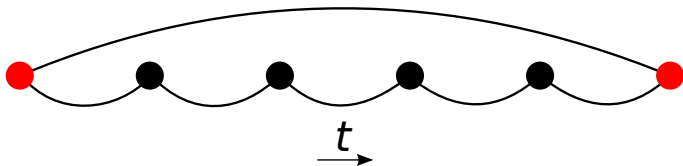
- ▶ Objective: promote public health and safety
- ▶ Strategy: get inside the humans' loops
- ▶ Loop: Observe, Orient, Decide, Act
- ▶ Advantage: scale and heterogeneity

Repository Observation

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

Dependency Orientation

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- Repository with revision dependencies
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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
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- 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!

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To Avalon

- 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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