What on Earth is Open Source?! 

observations from the Joint European Conferences on Theory and Practice of Software Warsaw, April 2003

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ETAPS OVERVIEW

- CC — International Conference on Compiler Construction
- ESOP — European Symposium on Programming
- FASE — Fundamental Approaches to Software Engineering
- FOSSACS — Foundations of Software Science and Computation Structures
- TACAS — Tools and Algorithms for the Construction and Analysis of Systems
- plus 22 satellite workshops...
THE ETAPS COMMUNITY

→ Bearded Oxford professors and their PhD students

→ Geeks like us, except:
The ETAPS Community

→ Bearded Oxford professors and their PhD students

→ Geeks like us, except:
  🆔 Most wear suits
  🆔 Most use PowerPoint
  🆔 Most don’t mind going to an invited lecture from Microsoft
  🆔 Many have never run a C compiler
  🆔 Most have wives and/or girlfriends
  🆔 All talk all day in Greek that’s all English to the Greeks.
A FRAGMENT OF SCC\textsubscript{ANF}

\begin{align*}
\mathcal{A}[v] & \quad \Gamma \quad \Omega = \langle \Gamma v, \Gamma, \Omega \rangle \\
\mathcal{A}[f(v_1, \ldots, v_n)] & \quad \Gamma \quad \Omega = \mathcal{E}_{\text{Abs}}[f(\Gamma v_1, \ldots, \Gamma v_n)] \\
| f \in \text{Prim} & \quad \mathcal{E}_{\text{Abs}}[f(\Gamma v_1, \ldots, \Gamma v_n)] = \langle \Gamma' f, \Gamma', \text{if changed then } \Omega \cup \{f\} \text{ else } \Omega \rangle \\
| \text{otherwise} & \quad \langle \Gamma' f, \Gamma', \text{if changed then } \Omega \cup \{f\} \text{ else } \Omega \rangle
\end{align*}

where

\begin{align*}
f & \text{ is defined as } f(x_1, \ldots, x_n) = e \\
\Gamma' & = \Gamma \cap [f \mapsto \bot, x_1 \mapsto \Gamma v_1, \ldots, x_n \mapsto \Gamma v_n] \\
\text{changed} & = \exists i. \Gamma x_i \sqsubseteq \Gamma v_i \quad \text{— indicates whether } \Gamma \text{ changed}
\end{align*}

\begin{align*}
\mathcal{A}\left[\text{letrec } f_1, \ldots, f_n \text{ in } e\right] & \quad \Gamma \quad \Omega = \\
\text{let} & \quad \langle a, \Gamma', \Omega' \rangle = \mathcal{A}[e]\Gamma \{\} \\
\langle \Gamma'', \Omega'' \rangle & = \mathcal{A}_{\text{fix}}[f_1, \ldots, f_n] \Gamma' (\Omega \cup \Omega') \\
\text{in} & \quad \text{if } \Gamma' = \Gamma'' \text{ then } \langle a, \Gamma', \Omega'' \rangle \text{ else } \mathcal{A}\left[\text{letrec } f_1, \ldots, f_n \text{ in } e\right] \Gamma'' \Omega''
\end{align*}

\begin{align*}
\mathcal{A}_{\text{fix}}[\text{fun}_1, \ldots, \text{fun}_n] & \quad \Gamma \Omega \quad | \# i. f_i \in \Omega = \langle \Gamma, \Omega \rangle \\
| \text{otherwise} & \quad = \\
\text{let} & \quad \langle a, \Gamma', \Omega' \rangle = \mathcal{A}[e]\Gamma \{\} \\
\Gamma'' & = \Gamma' \cap \{f_i \mapsto a\} \\
\Omega'' & = \Omega \cup \Omega' \setminus \{f_i\} \\
\text{in} & \quad \mathcal{A}_{\text{fix}}[\text{fun}_1, \ldots, \text{fun}_n] \Gamma'' (\text{if } \Gamma f_i \sqsubseteq \Gamma a \text{ then } \Omega'' \cup (\text{Occ } f_i \cap \text{Dom } \Gamma) \text{ else } \Omega'')
\end{align*}

where

\begin{align*}
(f_i(x_1, \ldots, x_m) = e) & = \text{fun}_i
\end{align*}
ATTITUDES TO OPEN SOURCE

➜ Peyton-Jones: *a matter of fact*
➜ Abramsky: *curiousity*
➜ Tony Hoare: *a fountain of test cases*
“A MATTER OF FACT”

Remember UN*X at Berkeley?

➔ Academia is not about releasing software, it’s about publishing papers

➔ Don’t care about:
  ☒ how the source code looks
  ☒ licencing, just a fact of life
  ☒ engineering benefits of open source
  ☒ Richard Stallman

➔ Care about:
  ☑ sharing of ideas
  ☑ benchmarks and graphs
  ☑ reuse of boring work
  ☑ bragging

➔ Finished, specialized software with a commercial potential likely to be closed-source.
“A Curiosity”

Just like any other computer user:

★ What’s all the fuss about?
★ What’s the difference anyway?
★ What’s the gain?
★ “If someone needs my stuff for their research, they can call my secretary and she’ll send it to them.”
★ “Software is software, it’s meant to be run not worshipped.”
“A FOUNTAIN OF TEST CASES”

From Tony Hoare’s *The Verified Compiler: A Grand Challenge for Computing Research*:

- “The corpus of Open Source Software is now universally available and used by millions, so justifying almost any effort expanded on improvement of its quality and robustness.”

- “For the first time, a large volume of real-life source code is available to test the success or failure of a software verification project.”
**CONCLUSION - SO, WHAT DO I SAY TO ABRAMSKY?**

Open Source is the journal of Software Development

- If I need a tool, I don’t care about the source code.
- I need the source code for critical analysis; to evaluate the author’s achievements in the field of software development.
- Open source projects are truly international.
- Open source projects facilitate peer review to the highest possible standards.
- An extremely successful method of software engineering.