

Integrated Development Environments

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February 13, 2013

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IDEs

Integrated Develop Environments (IDEs) are software packages that attempt to provide comprehensive support for programming

- and possible other software development activities

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1 The Components of an IDE

The Components of an IDE (minimal)

What's the minimum that we expect in an IDE?

- editor
- build
 - maybe no more than compiler invocation
 - with error messages captured/interpreted/walked by editor



- run/execute
- debugger

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The Components of an IDE (optional)

What would we like to see in an IDE?

- syntax highlighting & aid in editor
- documentation (API) look-up
- flexible/configurable build
- packaging/deployment options

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The Components of an IDE (deluxe)

What makes us giddy in an IDE?

- smart feedback in the editor
 - learns API of new code
 - suggestions
- coding aids in editor
 - templates
 - common refactoring (transformations)
- documentation generation
- test integration
- integration with version ctrl

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2 IDE Examples

emacs

The *nix swiss army knife of editors, *emacs* has long functioned as a basic IDE:

- syntax-highlighting editor
- build support (invokes *nix **make**)
 - parses error messages from compilers & other tools
- debugger interface
- works directly with many version control systems

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References, if you are unfamiliar with this:

- Compiling in emacs
- emacs Debugging mode (CS252)



emacs Strengths and Weaknesses

- highly portable
- supports virtually any language you would have a compiler for
- even in windowed mode, leans toward keyboard rather than mouse
 - (not sure if that's a pro or a con)
- outdated interface
- high learning curve

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Microsoft Visual

Visual Studio

- syntax-highlighting editor



- background compilation provides quick feedback on simple errors
- built-in build manager
 - limited configurability
- debugger interface
- some designer tools (e.g., design classes in UML)

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Visual Strengths and Weaknesses

- wide variety of languages (but Microsoft processors)
- single-OS
- closely integrated with Microsoft compilers
- modern, mouse-oriented interface



- What will Windows 8 do to that?

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I've never been fond of Visual, but that comes more from my opinion of the MS compilers. MS C++ had recurring issues with basic standards conformance and std library implementation. And MS's support of Java was perpetually lukewarm.

NetBeans

Free IDE originally distributed by Sun as “the” development platform for Java.

- Still largely Java centric, though some support for other languages
 - particularly web-related languages like Javascript, CSS, XSL
- Portable (written in Java)
- Tends to track the trends and hot topics in the Java world promptly
- editor, build manager, debugger



- moderately extensible

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Netbeans and Visual clearly stole interface ideas from one another.
(Then Eclipse came along and stole from them both.)

I have not used NetBeans in a long time. I remember it as being incredibly sluggish even on reasonably high-powered desktops.

My enduring impression is that Eclipse seemed to do everything NetBeans wanted to do, did it about 6 months later, but did it better.

Single-Language IDEs

The open source community has produced numerous single-language IDEs.
Many are focused on educational use.

Examples:

C++ Bloodshed Dev-C++, Code::Blocks

Java BlueJ, Dr. Java, jGrasp

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3 Eclipse

Eclipse

Probably the hottest IDE in the open source world:

- syntax-highlighting editor, multi-language support
 - strong hinting, API, interface aid
 - templates and refactoring
- build support
 - easily configured or switched to other build tools
- background compilation for quick detection of language errors
- integrated *unit testing support
- solid debugger, intuitive handling of threads
- some packaging & deployment support



- integrates with most version control systems
- modular plug-in extensibility with a rich variety available

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Eclipse is available here.

