

KiCad



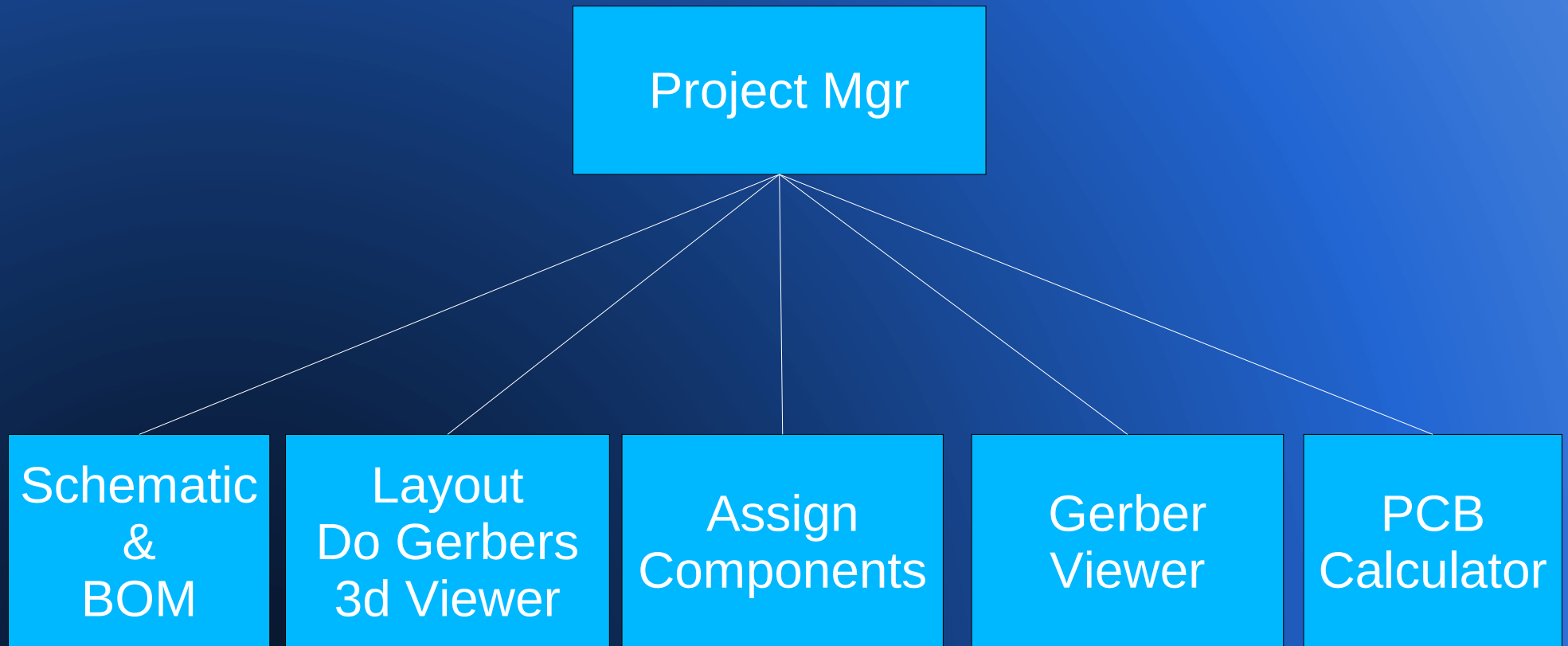
by Dick Hollenbeck
of SoftPLC Corp.
<http://softplc.com>

October 9, 2011
Grenoble, France

KiCad

- Topmost: Project Manager
 - Schematic (Hierarchical)
 - Component Assignment
 - Board Layout
 - ↔ Freerouter, w/ push & shove; auto-routing
 - Gerber Viewer
 - PCB Calculator
 - Extraneous File Viewing

KiCad



KiCad

- Runs on:
 - Windows. Pre-built binaries for download
 - Linux. Ubuntu PPA, pre-built packages for a number of distros. Easy to build from source.
 - OSX port needs work.
- UI in 20 different languages!

KiCad

- Demonstration Here

Project Infrastructure

- Key Players
 - Jean-Pierre Charras
 - Wayne Stambaugh
 - Dick Hollenbeck

Source Code Quality

- Project coding standards document exists
- Distributed version control system: Bazaar
- Code quality is very good, and this draws more contributors.

Rate of Advancement

- Velocity of project is rapid, and broadening
- Bugs are often fixed quickly
- Pays to build from source
- Testing version is almost always usable

Project Pace

- 454 code commits in 2011
- 661 code commits in 2010
- 640 code commits in 2009
- 855 code commits in 2008
- 548 code commits in 2007

Data File Formats

- Current file formats are all text, but ad hoc, and not self documenting.
- XML vs S-Expressions

```
<element>  
  <nested>content</nested>  
</element>
```

```
(element (nested content))
```

Signal to noise ratio is better for s-expressions. Most new work on data files is going to use s-expressions.

Project Philosophies

- New contributors can gain trust, get commit rights, then freely commit.
 - Gaining trust starts with following coding standards doc
- Qualified man-hours are expensive and scarce.
- We respect the time of the qualified help.
- We don't program on our hands and knees. We use C++ not C. Use good tools: CMake, Bazaar DVCS, wxWidgets, launchpad.net

Roadmap Items

- Use s-expressions for new data files & clipboard interchange, since we have an excellent infrastructure supporting s-expression grammars.
- Schematic editor is being revised to use a new file format and **Sweet** for parts. Preliminary schematic format document is already written.
- Denser boards require finer internal layout grid (internal units), than $1/10^{\text{th}}$ mil used now.

Roadmap Items Cont'd

- Denser boards require assistance in positioning parts so that they do not overlap at pads.
- More information passed from schematic to layout tools.
- Layout tool to know signal integrity constraints
- **Sweet** is a **declarative** schematic part description language based on s-expressions.
- Distributed schematic part retrieval.

Sweet

- Pertains to schematic parts, not footprints
- Dimensionless graphically
- Declarative not procedural
- Clipboard compatible
- Supports inheritance
- Supports a globally unique identifier which allows parts to be retrieved over the Internet.

Sweet Cont'd

- Supports versioning and pinning of part revisions
- Logical Part ID (LPID) example
 - `kicad:passives/R/rev6`

"kicad" is the **logical library** name.

"passives" is a category which is optional.

"passives/R" is the **partname**.

"rev6" is the **revision**, which is optional. If missing then its / delimiter should also not be present. A revision must begin with "rev" and be followed by at least one or more decimal digits.

Sweet Cont'd

R

'R' is a valid Sweet LPID. It needs no logical library name, has no category and states no revision.

The **logical library name** is a lookup key into **library table**:

Logical Library Name	Full URI
kicad	http://kilib.org
mylib	file:///kilibs

Sweet Cont'd

```
(part passives/R_SM0805
  (rectangle (start -2 -1)(end 2 1))
  (pin passive line (at -2 0)(pad 1)..)
  (pin passive line (at 2 0)(pad 2)..)
  (footprint SM0805)
)
```

Inheritance

```
(part R99 extends passives/R_SM0805
  (value "250 1%")
  (property vendor mouser (effects (at -2 -3)))
)
```

Notable Contributors

- See the “About KiCad” help menu item within any of the programs.

KiCad Summary

- I am a happy user of KiCad and have developed some very useful boards with it.
- I think you will also find it to be usable for most any board now, and even better in the future.
- We welcome useful contributions you can make.