

# Blackthorn: Lisp Game Engine

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## 1 What is Blackthorn?

Blackthorn is a framework for writing 2D games in Common Lisp. Blackthorn is attempt to write an efficient, dynamic, persistent 2D game engine in an expressive language which makes it easy to write games.

## 2 Why another game engine?

Games are hard to write. The effort needed to write a usable game engine from scratch, especially when dealing with the low-level details of languages like C, make the cost of writing games prohibitive. Libraries like SDL get many of the driver-level graphics details out of the way, but still leave the user writing in C. Libraries like PyGame and LISPBUILDER-SDL wrap more of these low-level details, but still don't provide a full game engine needed for writing substantial games.

There are, of course, game engines which provide this functionality to the user. Game Maker, for example, is an engine which provides everything needed to make a basic game, and an extension language for writing more complex

behavior. Using Game Maker, an experienced user can write a basic game in five minutes. However, Game Maker (and similar programs the authors have tried) have some substantial flaws. Problems with Game Maker, specifically, include:

- Game Maker only runs on Windows. A Linux port is still a dream, and porting to any sort of mobile device is completely unimaginable.
- Game Maker's extension language, GML, is a kludge, and inefficient. (The lack of a rich set of built-in datastructures is something I hear GML users complaining about frequently.)
- Game Maker is closed source, so it would be impossible for anyone other than the authors to fix any of the above problems with Game Maker.

### 3 What does Blackthorn provide?

Blackthorn attempts to fix many of the problems above. Blackthorn provides:

- A not-yet-complete subset of the functionality provided by Game Maker. Despite being incomplete, Blackthorn is already capable of supporting simple games.
- Blackthorn is written in Common Lisp, providing:
  - Efficiency which is (depending on the implementation, and the benchmark) capable of competing with C.
  - Portable to any platform supported by a compliant ANSI Common Lisp compiler. Blackthorn currently runs on Windows, Linux, and Mac OSX. Porting Blackthorn to a new compiler takes a couple of hours.
  - Dynamic behavior, because the entire compiler is available at runtime. An on-screen development REPL (read-eval-print loop, i.e. a development console) with an on-screen debugger is provided, giving the user the ability to rewrite arbitrary pieces of code on the fly.
  - Extensibility, because the game engine itself is an open platform, and because user code operates at the same level as the game engine.
  - And finally, because Blackthorn is open source, it is open to improvements from the community.

### 4 Technical details

Blackthorn uses LISPBUILDER-SDL for graphics support (which internally uses SDL and SDL\_image), and CL-STORE as an internal database for object persistence.

Blackthorn currently runs on Windows, Linux, and Mac OS X, under Allegro CL, CLISP, Clozure CL, and SBCL. Blackthorn has been tested successfully on the following OS/Lisp combinations:

	Windows	Linux	Mac OS X
Allegro CL	Yes	??	??
CLISP	Yes	Yes	Yes
Clozure CL	Yes	Yes	No
SBCL	Yes	Yes	Yes

Among the compatible compilers, SBCL is suggested because it is (a) free and open source, (b) compatible with Windows, Linux and Mac, and (c) has the best performance of the compilers listed. Allegro CL is also a good choice, but is commercial software (although a free version is available).

## 4.1 Direct dependencies

- LISPBUILDER-SDL and -SDL-IMAGE
- CL-STORE
- CL-Containers
- Trivial Garbage
- CL-FAD

## 4.2 Windows only (optional)

- Cygwin or GnuWin32 to use the Makefile
- NSIS for building installers

# 5 Installation

Download the source using darcs

```
darcs get http://common-lisp.net/~eslaughter/darcs/blackthorn
```

To start Blackthorn from the shell, merely call make

```
make
```

Optionally, use parameters to specify the build environment, e.g.

```
make cl=sbcl db=nodb driver=load.lisp system=bunnyslayer
```

If instead you prefer to start Blackthorn interactively, start your Lisp and

```
(load "load")
```

## 6 Download

Binary distributions are made semi-frequently and are available for download at <http://elliottslaughter.net/bunnyslayer/download>. License

Blackthorn is free and open source software, see the COPYRIGHT file for details.