

Boardwalk

Introduction

By Mike Hahn

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Overview

Introduction to Boardwalk

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Boardwalk is a software tool that lets you create multiplayer board games. Subsequent versions of Boardwalk may add support for games with 2D animation. Boardwalk runs under Linux and will be implemented using Python. Its target platform is the XO Laptop.

Using a built-in scripting language called Treescrypt, developers can create almost any game imaginable. Subsequent versions of Boardwalk may enable games to be coded in Python instead of Treescrypt. Non-programmers can create drag-and-drop board games, and programmers can add functionality to these games.

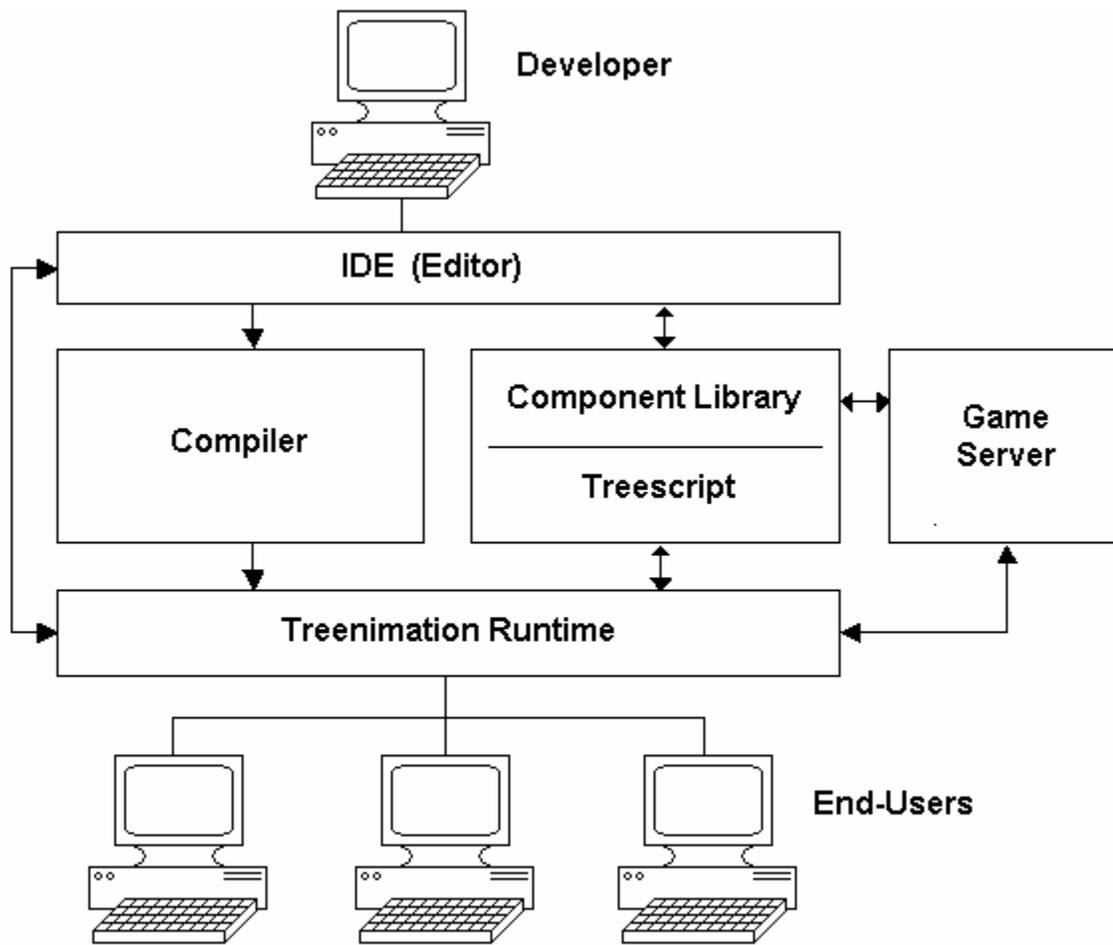
The primary goal of Boardwalk is to enable both programmers and non-programmers to create board games more easily than with a conventional RAD tool such as Visual Basic or Delphi. A secondary goal is to create in Treescrypt a simple yet powerful scripting language that is even easier for a beginner to master than Python.

Goals

The all-encompassing goal of Boardwalk is ease of use. Here are the other goals, in descending order of importance:

1. OLPC kids (One Laptop Per Child, see <http://www.laptop.org>), with minimal support from their teachers, can use Boardwalk to create drag-and-drop multiplayer board games.
2. Non-programming adults and teens can easily use Boardwalk to create drag-and-drop multiplayer board games, without being coached by Boardwalk gurus and/or tech support.
3. Non-programming high school students and undergraduates can learn Treescrypt as a first programming language more easily than any other Graphical User Interface (GUI) programming tool.
4. Programming novices (who are already familiar with at least one other GUI programming tool) can master Treescrypt in one month or less, on their own, with little or no coaching from Boardwalk gurus and/or tech support.
5. Advanced programmers can master Treescrypt as easily as falling off the proverbial log, unlike most existing GUI programming tools.
6. A vibrant Boardwalk community blossoms, consisting of game developers and game players from all around the world.

Block Diagram



Board Games

Board Game Codes

This web site describes using Boardwalk to make multiplayer Scramble, backgammon and bridge. Non-programmers are restricted to No-Code (codeless programming) drag-and-drop type games. Code 1 (Automation) is the easiest type of game programming, which involves automating various aspects of the game-player environment and game-playing process. Code 2 (Move Constraints), or checking for illegal moves, is a little harder. Code 3 (Auto Move), playing against the computer, is the most challenging type of game programming.

No-Code: Codeless Programming (drag and drop)

Code 1: Automation of simple tasks

Code 2: Move Constraints (checking for illegal moves)

Code 3: Auto Move (playing against the computer)

Animation

Low-Level Components

Boardwalk, in subsequent versions, may be used to make multiplayer animated games (if the XO Laptop is not too slow), and these games are coded in a built-in scripting language called Treescrypt. Non-programmers can use the Level Editor and the Vector Editor to create simple animated games, and programmers can add functionality to these games.

These low-level components are the basic building blocks of animated games, otherwise known as “atoms.”

Coord: Point on screen

Rect: Rectangle

Quad: Rectangle with fill color

Ellipse: Circle or oval

Disc: Ellipse with fill color

Polyline: Set of connected line segments

Shape: Set of connected line segments (polygon with fill)

Bitmap: Rectangular array of pixels (colored dots)

Text: Label containing text

High-Level Components

Vector: collection of atoms and/or other vectors

Window: Rectangular area on screen, static or animated.

User: Game player

Level: Arena containing game action

Game: Collection of levels making up a complete game

In-Progress: Game in progress – web site includes list of these

Event Handling

Keyboard: These events are handled at the user level.

Mouse: These events are handled at the vector level.

Collision Detection: These events are triggered when 2 atoms collide.

Timer: These events are triggered after every N frame changes.

Treescript

Treescript Overview

All Boardwalk games are written in a built-in scripting language called Treescript (subsequent versions of Boardwalk may enable games to be coded in Python instead of Treescript). Treescript is a powerful object-oriented language which is designed with beginner programmers in mind. Pressing the question mark key (?) when in the code editor brings up a popup menu of choices valid in the context of the text cursor position. Optional Structure-Editor mode eases code entry for naïve users. The default operator/operand mode is prefix (operators come before their operands) as opposed to optional infix (binary operators come in between their operands). Treescript is based on Java, and when infix mode is selected, Treescript code strongly resembles Java, with a touch of Object Pascal thrown in for good measure.

Language Features

- **Syntax:** Treescript is a subset of Java, although the syntax differs radically from Java, in that all operators are, by default, prefix (like Lisp) rather than infix, and parentheses are used for grouping.
- **Semicolons:** Statements and declarations are semicolon-delimited.
- **Case:** Treescript is case-sensitive: the convention for identifiers is all lower case, hyphens being used to separate parts of multi-word identifiers. Class names are an exception: the initial letter is upper case.
- **Keyboard Aid:** When enabled, this feature allows the user to enter a hyphen followed by a lower case letter by typing an upper case letter (but only when the text cursor is in the middle or at the end of an identifier). Alternatively, the user may enter a hyphen by typing a quote ('). Also, commas and periods are immediately converted into parentheses if desired (if the period key is used to enter ')', then the ')' key may be used to enter a decimal point). The user may toggle Code Menu mode by typing slash (/) instead of question mark (?). Keyboard Aid is always disabled inside comments and string literals.
- **Meta-Programming:** Treescript programs are lists, which can act as data for other Treescript programs. Structure editor mode lets newbies create simple event handlers without having to know the syntax of the Treescript programming language.