

# LiveCode 9.0.0-dp-2 Release Notes

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## Overview

LiveCode 9.0 enables access to libraries and platform APIs written in many other languages thanks to the community-funded 'Infinite LiveCode' project.

This includes a greatly improved LiveCode Builder virtual machine.

LiveCode 9.0 contains many additional improvements to support LiveCode app developers, including:

- A new "spinner" widget
- OAuth2 authentication library for use with web APIs (e.g. Facebook, Google and GitHub)
- A command argument parser library for building command-line standalones
- Updates and performance improvements for existing widgets

## Known issues

- The installer will currently fail if you run it from a network share on Windows. Please copy the installer to a local disk before launching on this platform.
- The browser widget does not work on 32-bit Linux.
- 64-bit standalones for Mac OS X do not have support for audio recording or the revVideoGrabber external.

## Platform support

The engine supports a variety of operating systems and versions. This section describes the platforms that we ensure the engine runs on without issue (although in some cases with reduced functionality).

### Windows

LiveCode supports the following versions of Windows:

- Windows 7 (both 32-bit and 64-bit)
- Windows Server 2008

- Windows 8.x (Desktop)
- Windows 10

**Note:** On 64-bit Windows installations, LiveCode runs as a 32-bit application through the WoW layer.

## Linux

LiveCode supports the following Linux distributions, on 32-bit or 64-bit Intel/AMD or compatible processors:

- Ubuntu 14.04 and 16.04
- Fedora 23 & 24
- Debian 7 (Wheezy) and 8 (Jessie) [server]
- CentOS 7 [server]

LiveCode may also run on Linux installations which meet the following requirements:

- Required dependencies for core functionality:
  - glibc 2.13 or later
  - glib 2.0 or later
- Optional requirements for GUI functionality:
  - GTK/GDK 2.24 or later
  - Pango with Xft support
  - esd (optional, needed for audio output)
  - mplayer (optional, needed for media player functionality)
  - lcms (optional, required for color profile support in images)
  - gksu (optional, required for privilege elevation support)

**Note:** If the optional requirements are not present then LiveCode will still run but the specified features will be disabled.

**Note:** The requirements for GUI functionality are also required by Firefox and Chrome, so if your Linux distribution runs one of those, it will run LiveCode.

**Note:** It may be possible to compile and run LiveCode Community for Linux on other architectures but this is not officially supported.

## Mac

The Mac engine supports:

- 10.9.x (Mavericks) on Intel
- 10.10.x (Yosemite) on Intel
- 10.11.x (El Capitan) on Intel
- 10.12.x (Sierra) on Intel

## iOS

iOS deployment is possible when running LiveCode IDE on a Mac, and provided Xcode is installed and has been set in LiveCode *Preferences* (in the *Mobile Support* pane).

Currently, the supported versions of Xcode are:

- Xcode 6.2 on MacOS X 10.9
- Xcode 6.2 and 7.2 on Mac OS X 10.10
- Xcode 8.1 on MacOS X 10.11
- Xcode 8.1 on MacOS 10.12

It is also possible to set other versions of Xcode, to allow testing on a wider range of iOS simulators. For instance, on MacOS 10.12 (Sierra), you can add *Xcode 6.2* in the *Mobile Support* preferences, to let you test your stack on the *iOS Simulator 8.2*.

We currently support deployment for the following versions of iOS:

- 8.2 [simulator]
- 9.2
- 10.1

## Android

LiveCode allows you to save your stack as an Android application, and also to deploy it on an Android device or simulator from the IDE.

Android deployment is possible from Windows, Linux and Mac OSX.

The Android engine supports devices using ARMv7 or ARMv8 processors. It will run on the following versions of Android:

- 4.1-4.3 (Jelly Bean)
- 4.4 (KitKat)
- 5.0-5.1 (Lollipop)
- 6.0 (Marshmallow)

To enable deployment to Android devices, you need to download the [Android SDK](#), and then use the 'Android SDK Manager' to install:

- the latest "Android SDK Tools"
- the latest "Android SDK Platform Tools"

You also need to install the Java Development Kit (JDK). On Linux, this usually packaged as "openjdk". LiveCode requires JDK version 1.6 or later.

Once you have set the path of your Android SDK in the "Mobile Support" section of the LiveCode IDE's preferences, you can deploy your stack to Android devices.

Some users have reported successful Android Watch deployment, but it is not officially supported.

## HTML5

LiveCode applications can be deployed to run in a web browser, by running the LiveCode engine in JavaScript and using modern HTML5 JavaScript APIs.

HTML5 deployment does not require any additional development tools to be installed.

LiveCode HTML5 standalone applications are currently supported for running in recent versions of [Mozilla Firefox](#), [Google Chrome](#) or [Safari](#). For more information, please see the "HTML5 Deployment" guide in the LiveCode IDE.

## Setup

### Installation

Each version of LiveCode installs can be installed to its own, separate folder. This allow multiple versions of LiveCode to be installed side-by-side. On Windows (and Linux), each version of LiveCode has its own Start Menu (or application menu) entry. On Mac OS X, each version has its own app bundle.

On Mac OS X, install LiveCode by mounting the `.dmg` file and dragging the app bundle to the `Applications` folder (or any other suitable location).

For Windows and Linux, the default installation locations when installing for "All Users" are:

Platform	Path
Windows	<code>&lt;x86 program files folder&gt;/RunRev/LiveCode &lt;version&gt;</code>
Linux	<code>/opt/livecode/livecode-&lt;version&gt;</code>

The installations when installing for "This User" are:

Platform	Path
Windows	<code>&lt;user roaming app data folder&gt;/RunRev/Components/LiveCode &lt;version&gt;</code>
Linux	<code>~/.runrev/components/livecode-&lt;version&gt;</code>

**Note:** If installing for "All Users" on Linux, either the **gksu** tool must be available, or you must manually run the LiveCode installer executable as root (e.g. using **sudo** or **su**).

### Uninstallation

On Windows, the installer hooks into the standard Windows uninstall mechanism. This is accessible from the "Add or Remove Programs" applet in the windows Control Panel.

On Mac OS X, drag the app bundle to the Trash.

On Linux, LiveCode can be removed using the `setup.x86` or `setup.x86_64` program located in LiveCode's installation directory.

### Reporting installer issues

If you find that the installer fails to work for you then please report it using the [LiveCode Quality Control Centre](#) or by emailing [support@livecode.com](mailto:support@livecode.com).

Please include the following information in your report:

- Your platform and operating system version
- The location of your home or user folder
- The type of user account you are using (guest, restricted, admin etc.)
- The installer log file.

The installer log file can be located as follows:

Platform	Path
Windows 2000/XP	<documents and settings folder>/<user>/Local Settings/
Windows Vista/7	<users folder>/<user>/AppData/Local/RunRev/Logs
Linux	<home>/runrev/logs

## Activating LiveCode Indy or Business edition

The licensing system ties your product licenses to a customer account system, meaning that you no longer have to worry about finding a license key after installing a new copy of LiveCode. Instead, you simply have to enter your email address and password that has been registered with our customer account system and your license key will be retrieved automatically.

Alternatively it is possible to activate the product via the use of a specially encrypted license file. These will be available for download from the customer center after logging into your account. This method will allow the product to be installed on machines that do not have access to the internet.

## Command-line installation

It is possible to invoke the installer from the command-line on Linux and Windows. When doing command-line installation, no GUI will be displayed. The installation process is controlled by arguments passed to the installer.

Run the installer using a command in the form:

```
<installer> install noui [OPTION ...]
```

where `<installer>` should be replaced with the path of the installer executable or app (inside the DMG) that has been downloaded. The result of the installation operation will be written to the console.

The installer understands any of the following `OPTION`s:

Option	Description
<code>-allusers</code>	Install the IDE for "All Users". If not specified, LiveCode will be installed for the current user only.
<code>-desktopshortcut</code>	Place a shortcut on the Desktop (Windows-only)
<code>-startmenu</code>	Place shortcuts in the Start Menu (Windows-only)

Option	Description
-location LOCATION	The folder to install into. If not specified, the LOCATION defaults to those described in the "Installation" section above.
-log LOGFILE	The file to which to log installation actions. If not specified, no log is generated.

**Note:** the command-line installer does not do any authentication. When installing for "All Users", you will need to run the installer command as an administrator.

As the installer is actually a GUI application, it needs to be run slightly differently from other command-line programs.

On Windows, the command is:

```
start /wait <installer> install noui [OPTION ...]
```

## Command-line uninstallation

It is possible to uninstall LiveCode from the command-line on Windows and Linux. When doing command-line uninstallation, no GUI will be displayed.

Run the uninstaller using a command of the form:

```
<uninstaller> uninstall noui
```

Where is *.setup.exe* on Windows, and *.setup.x86* on Linux. This executable, for both of the platforms, is located in the folder where LiveCode is installed.

The result of the uninstallation operation will be written to the console.

**Note:** the command-line uninstaller does not do any authentication. When removing a version of LiveCode installed for "All Users", you will need to run the uninstaller command as an administrator.

## Command-line activation for LiveCode Indy or Business edition

It is possible to activate an installation of LiveCode for all users by using the command-line. When performing command-line activation, no GUI is displayed. Activation is controlled by passing command-line arguments to LiveCode.

Activate LiveCode using a command of the form:

```
<livecode> activate -file LICENSEFILE -passphrase SECRET
```

where `<livecode>` should be replaced with the path to the LiveCode executable or app that has been previously installed.

This loads license information from the manual activation file `LICENSEFILE`, decrypts it using the

given **SECRET** passphrase, and installs a license file for all users of the computer. Manual activation files can be downloaded from the [My Products](#) page in the LiveCode account management site.

It is also possible to deactivate LiveCode with:

```
<livecode> deactivate
```

Since LiveCode is actually a GUI application, it needs to be run slightly differently from other command-line programs.

On Windows, the command is:

```
start /wait <livecode> activate -file LICENSE -passphrase SECRET
start /wait <livecode> deactivate
```

On Mac OS X, you need to do:

```
<livecode>/Contents/MacOS/LiveCode activate -file LICENSE -passphrase SECRET
<livecode>/Contents/MacOS/LiveCode deactivate
```

## Engine changes

### Calling JavaScript from HTML5 (9.0.0-dp-2)

JavaScript has been added to the **alternateLanguages** on the HTML5 platform.

It is now possible to call JavaScript code from HTML5 standalones by using the `do <script> as <alternateLanguage>` form of the **do** command.

This allows HTML5 standalones to interact with the browser within which they are running. The value of the JavaScript expression will be placed in the **result** variable:

```
local tDocTitle
do "document.title" as "JavaScript"
put the result into tDocTitle
```

### Re-written LCB VM (9.0.0-dp-2)

The "virtual machine" used to run LiveCode Builder code has been re-written from scratch. This new VM provides a framework enabling better extensibility, better error reporting and, in future, more comprehensive optimizations.

Most existing LCB code should run without any changes. There may be some code that worked on

the previous VM but doesn't in the new VM due to more comprehensive run-time checking; this is usually fixable with only very minor changes to the source code.

## Undocumented multi-file `libUrlMultipartFormAddPart` removed (9.0.0-dp-2)

Previously, the **`libUrlMultipartFormAddPart`** command had the undocumented capability to accept multiple file names separated by commas. The handler failed to work for files that had commas in the name, however. The undocumented behaviour has been removed. To add multiple files to a form, call **`libURLMultipartFormAddPart`** once for each file.

## `libURLSetStatusCallback` no longer requires a target object for the message (9.0.0-dp-1)

Passing an object reference as a second parameter to `libURLSetStatusCallback` is no longer required. If no object is passed in then the message will be sent to `revLibURL` itself and you can handle the message anywhere in the message path.

## Platform support end-of-life (9.0.0-dp-1)

As [announced on the LiveCode blog](#), running LiveCode on the following platforms is no longer officially supported from LiveCode 9.0 onwards:

- Windows XP
- Windows Server 2003
- Windows Vista
- Android Gingerbread (2.3.3-2.3.7)
- Android Ice Cream Sandwich (4.0)
- OS X Snow Leopard (10.6)
- OS X Lion (10.7)
- OS X Mountain Lion (10.8)
- iOS Simulator 6.1
- iOS Simulator 7.1

## Field tab alignments in `htmlText` and `styledText` (9.0.0-dp-1)

The **`styledText`** and **`htmlText`** of a field now include tab alignment information. The **`htmlText`** uses a new `tabalign` attribute with a list of alignments, e.g.

```
<p tabalign='left,center,right'>left&09;middle&09;right&09;</p>
```

The **`styledText`** stores tab alignment in a "tabalign" key in each paragraph's "style" array, e.g.

```
get tStyledText[1]["style"]["tabalign"]
```

## Specific engine bug fixes (9.0.0-dp-2)

- 12196** Correct documentation for "do" command
- 18147** The scriptExecutionErrors property not listed in dictionary
- 18231** Fixed documentation formatting issues for binaryEncode and binaryDecode
- 18350** Fix spurious type errors for repeat variables in LCB
- 18353** Remove duplicated urlResponse documentation
- 18495** Undocumented multi-file libUrlMultipartFormAddPart removed
- 18539** Don't change the defaultFolder on startup
- 18600** Fix crash when quitting from script editor
- 18632** Mark the copyResource function as deprecated
- 18651** Ensure "10 garbage" is never a number
- 18666** Fix crash when find command matches text in sharedText field on non-current card
- 18724** Fix incorrect cross-references in lockLocation dictionary entry
- 18743** Fix missing cross-references in "keys" dictionary entry
- 18774** Fix errors in "write to file" dictionary entry
- 18821** Report all LCB stack frames in LCS error info

## Specific engine bug fixes (9.0.0-dp-1)

- 14645 Field tab alignments in htmlText and styledText
- 14651 There is no documentation entry for "currentcard"
- 15865 Fixed Dictionary description for "is not among"
- 16211 Fix compilation errors with MacOSX SDK 10.10 and higher
- 18111 Make PDF user guide typography match dictionary view
- 18125 Fix Dictionary example for is within
- 18254 Improve efficiency of equality operators on binary data
- 18297 Broken references in "filename of stack" dictionary entry
- 18357 dispatch documentation should mention arguments can be arrays
- 18465 Syntax: mouseUp mouseButtonNumber
- 18537 Fix crash when saving stack on OSX ElCapitan
- 18579 Support defaultNetworkInterface for the accept command
- 18588 Fix a crash due to pending messages to deleted objects

## IDE changes

### Allow substack to become a mainstack via property inspector (9.0.0-dp-2)

The property inspector Basic pane for substacks now has a button beneath the mainstack labelled "Make mainstack". Note that once pressed this button will disappear, as the stack will no longer a substack.

## Drag and drop stackfiles (9.0.0-dp-2)

You can now drag and drop stack files onto the stackFiles field in the PI.

## Specific IDE bug fixes (9.0.0-dp-2)

- 18302** Retain custom prop changes when clicking on tree view in editor
- 18393** [Project Browser] Change "Sort controls by number" to "Sort controls by layer" to avoid confusion + make sure they are sorted numerically
- 18491** Allow substack to become a mainstack via property inspector
- 18595** Clicking left of text now moves caret to the beginning of text
- 18631** Only use development team preferences when running from the repository
- 18637** Fix searching in "Stack File and its stack files" from the script editor
- 18644** Deactivate breakpoints correctly
- 18701** Prevent over-enthusiastic save prompts
- 18726** Make sure the Bug Report checkmark appears at the correct place in Standalone Settings
- 18804** Update locked inspectors when mainstack names change
- 18835** linkVisitedColor and linkHiliteColor can now be set from property inspector
- 18878** Setting stackFiles in PI causes an error if you "cancel" the file dialog or select multiple files
- 5787** Drag and drop stackfiles

## Specific IDE bug fixes (9.0.0-dp-1)

- 13997** Fix issue creating breakpoints via the new breakpoint dialog
- 15830** Improve user feedback for invalid breakpoint conditions
- 18043** Add warning about numerical names to user guide.
- 18355** Bring script editor and documentation stacks to front if the stack is already open when navigating to content
- 18475** textFont of control does not get set when tabbing out of textFont comboBox in P.I.

## LiveCode Builder changes

### LiveCode Builder Documentation

#### Style guide

- Updated naming guide for handlers and types
- Added indentation and wrapping guidelines
- New section with widget-specific recommendations

## LiveCode Builder Tools

### lc-run

- **lc-run** now has the *experimental* ability to load and run bytecode assemblies containing multiple LCB modules. To construct a multi-module bytecode assembly, simply concatenate several `.lcm` module files together. The first module found in a bytecode assembly is treated as its main module.

### lc-compile

#### Errors

- Parsing of numeric literals, in general, has been tightened up. In particular, the compiler will detect invalid suffixes on numeric literals meaning you cannot accidentally elide a number with an identifier.

```
1.344foo -- ERROR
0xabcdefgh -- ERROR
0b010432 -- ERROR
```

#### Messages

- Errors, warnings and informational messages now display the affected line of code and visually indicate the position where the problem was found. For example, the output might look like:

```
foo.lcb:2:26: error: Identifier 'InvalidExpression' not declared
constant kBadConstant is InvalidExpression
                        ^
```

## LiveCode Builder Language

### Literals

- Base 2 (binary) integer literals can now be specified by using a "0b" prefix, e.g.

```
0b0000
0b1010
```

- Base 16 (hexadecimal) integer literals can now be specified by using a "0x" prefix. e.g.

```
0xdeadbeef
0x0123fedc
```

## Specific LCB bug fixes (9.0.0-dp-2)

**18856** Use cached numeric values when converting numbers to/from strings

## Specific LCB bug fixes (9.0.0-dp-1)

**18086** Improve and expand LCB style guide

**18385** lc-run: Load multi-module bytecode assemblies.

**18463** Show correct error position when source line includes tabs

## LiveCode extension changes

### Spinner widget

#### Spinner widget

A new spinner or activity indicator widget has been implemented. Spinners provide visual feedback to users use when performing an activity for an unknown duration such as processing a large amount of data or presenting a complex user interface.

### Line Graph widget

#### Markers

- The new **markerScale** property controls the size of graph point markers.
- Any named icon from the SVG icon library can now be used as a graph point marker.

### Tree View widget

#### Performance

- Previously when an array was expanded in the Tree View widget, all of the display calculations for were done before the next redraw. Now the keys are sorted (as before) but the display calculations are made for a maximum of 1000 rows. When more rows are needed due to scrolling, another 1000 are calculated at that point.

This provides a near-continuous scrolling experience for arrays with large numbers of keys, and ties the expense of expanding an array to that of sorting its keys.

### Segmented Control widget

## Appearance and theming

- Dividers between segments are no longer drawn when the **showBorder** property is `false`

## Properties

- Setting the **itemCount** now updates all other properties immediately, rather than at the next redraw
- All list-like properties now contain exactly **itemCount** items at all times
- The **itemNames** property may now include duplicated and/or empty segment names

## JSON Library

### JSON parser improvements

- `JsonImport()` no longer incorrectly accepts garbage at the end of a JSON file.
- `JsonImport()` no longer incorrectly accepts unescaped control characters in strings
- "null" is a valid JSON file, and `JsonImport("null")` no longer throws an error. It returns `nothing` in LCB and the empty string in LiveCode Script.
- A number by itself is a valid JSON file, and `JSONImport("25")` now returns 25, rather than throwing a syntax error.

### JSON parser security fixes

- Some crafted JSON files could cause **JsonImport** to use excessive amounts of CPU time. The **JsonImport** function will now reject inputs with more than 500 levels of structure nesting.

## oauth2 script library

### OAuth2 dialog library

A new library has been implemented for presenting an OAuth2 authorization dialog for any web service that supports OAuth2 Authorization Code Flow

## getopt script library

### Command-line option parsing support

The new **getopt** library provides support for parsing Linux-style command-line options.

## Specific extension bug fixes (9.0.0-dp-2)

- 18500** Ensure color properties are documented correctly
- 18693** Prevent long delays when expanding arrays with many keys
- 18697** Fix parsing of "lonely number" JSON files
- 18707** Fix possible denial of service via crafted JSON inputs
- 18714** Ensure all `itemName`s, `itemLabels` etc. can be set to empty
- 18779** Do not draw borders when `showBorder` is disabled

## Previous release notes

- [LiveCode 8.1.1 Release Notes](#)
- [LiveCode 8.1.0 Release Notes](#)
- [LiveCode 8.0.2 Release Notes](#)
- [LiveCode 8.0.1 Release Notes](#)
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