

# LiveCode 9.0.2-rc-1 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.

## Breaking changes

### Standalone Building

The standalone builder has always needed to close the stacks it builds for reasons pretty deeply ingrained in the code. However this causes a few problems, for example:

- values in script locals become empty
- behaviors are broken when the parent script is on / in a stack which closes

As an attempt to improve this situation, the code that locks messages when closing and opening stacks for standalone builds has been removed. This means that where previously mainstacks would not receive any of the (pre)open\* and close\* messages (e.g. preOpenStack, openStack, openCard, closeStack etc) during standalone build, they now do.

If this causes problems for your stack, you can exit from the handler if standalone building is in progress:

```

on closeStack
  if the environment is "development" and \
    there is a stack "revStandaloneProgress" and \
    the mode of stack "revStandaloneProgress" > 0 then
    exit closeStack
  end if
end closeStack

```

## LiveCode Builder

### Exponentiation operator precedence

Prior to this release, exponentiation had lower precedence than unary minus. In order to write code that operates as expected in both this release and previous releases, please use parentheses where appropriate.

Using lc-compile tool in LiveCode 9:

```
-1^2 = -1
```

Using lc-compile tool in LiveCode 8:

```
-1^2 = 1
```

## 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)
- 10.10.x (Yosemite)
- 10.11.x (El Capitan)
- 10.12.x (Sierra)
- 10.13.x (High Sierra)
- 10.14.x (Mojave)

## 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 8.2 on MacOS X 10.11
- Xcode 9.2 on MacOS 10.12 (Note: You need to upgrade to 10.12.6)
- Xcode 10.0 on MacOS 10.13 (Note: You need to upgrade to 10.13.4)

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
- 10.2
- 11.2
- 12.0

## 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)
- 7.x (Nougat)
- 8.x (Oreo)

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
	Install the IDE for "All Users". If not specified, LiveCode will be installed

Option	Description
-all	for the current user only.
-desktopshortcut	Place a shortcut on the Desktop (Windows-only)
-startmenu	Place shortcuts in the Start Menu (Windows-only)
-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
```

## LiveCode Community engine changes

### Specific engine bug fixes (9.0.2-rc-1)

- 9030** Clarify how `pageRect` works
- 9711** Ensure right-clicking on a grouped radio button does not change the hilite of the group
- 11792** Added note in the documentation for copy that copy operations that result in an object being put on the clipboard are not supported on mobile
- 11794** Fix crash on iOS when calling `hide this stack with visual ..` and the stack's name is `with`
- 15167** Allow `&` and other special characters in the android standalone label
- 17751** Correct the loc of option menus and pulldown menus triggered by a popup stack
- 18395** Fix return key event handling in fields on Android

- 19550** Add support for symbolic links in Mac/Linux standalone applications
- 19597** Add UDP into summary
- 19670** Fix effective working screenrect on Android when status bar is hidden
- 19704** Fixed bug causing minWidth & minHeight to not work on HiDPI Screens in Win32
- 20193** Fix import snapshot from rect causing other applications to lose focus on Windows
- 20283** Updated broken links in `encrypt using rsa` dictionary entry
- 20529** MouseEnter and MouseLeave infinite loop trap - docs update
- 20640** Updated orientation docs for iPhone X support
- 20722** Update launch URL command note for Android.
- 20917** Fixed broken links in "URL scheme" entry
- 20943** Added explicit RegEx escape character use examples
- 21104** Fixed typo in the print dictionary entry
- 21230** Fixed bug in resolveAlias on Win32
- 21270** Added systems requirement note to revOpenDatabase
- 21312** Updated Visual Effects and Unlock Screen docs
- 21406** Added `alphabetic` to the list of keyboard types in the `mobileSetKeyboardType` entry
- 21436** Clarified the behaviour of repeat with.
- 21453** Fix crash when calling 'open process path/to/app/bundle'
- 21458** Added "the number of elements of array" to the syntax in the entry for the number.
- 21468** Include .framework folders in iOS extension code folders
- 21469** Ensure iOS apps with embedded frameworks are correctly signed
- 21474** Fix unresponsive stack after drag and drop
- 21476** Ensure "the extents of tArray" returns empty if the keys of tArray are not integers
- 21488** Fix automatic architecture detection on some Linux systems
- 21491** Ensure pageRanges and pageHeights return correct results
- 21494** Correct missing text issue in the Round function dictionary entry.
- 21500** Fix crash when ungrouping a group before calling quit
- 21527** Include iPadPro splash image in plist file
- 21529** Fixed typo and incomplete example in Release Notes
- 21552** Prevent accidental deletion of a file when building a standalone
- 21556** Fixed missing text issue in the libraryStack dictionary entry
- 21572** Added list of blend modes to CanvasPropertyBlendMode and EffectPropertyBlendMode
- 21582** Fix crash and stack corruption when opening a stack that has a colorswatch widget
- 21592** Corrected several typos in the revOpenDatabase dictionary entry.
- 21595** Android API 26: allow opening local files with JavaScript on Android Browser
- 21608** Fix application lockup when invoking a handler from the browser widget on iOS 12
- 21612** Fix crash sending touch events to a deleted stack

- 21617** Fix failure to load HTML5 standalones when mainstack is greater than 1MB
- 21623** Ensure stack vScroll due to a menubar on Mac is handled correctly when opening a card in an existing window
- 21624** Fix rendering issues in Motif appearance (default for iOS, Android and HTML5) when a button is disabled and has a non-zero blendlevel
- 21629** Fix display update issues on iOS 12 when not using accelerated rendering
- 21644** Updated beepSound dictionary entry
- 21647** Dictionary error: description of exp1
- 21650** Fix crash on iOS when changing cards and acceleratedRendering is true
- 21658** Provide an example of using ODBC with a fileDSN on Windows
- 21662** Fix crash when setting the scrollbar to false while scrolling
- 21664** Clarified the behaviour of the sheet command.
- 21667** Fix exception thrown when calling revBrowserPrint
- 21669** Ensure an error is thrown if no Map API key is specified
- 21672** Disable iOS 11 native scroller content inset adjustment behavior
- 21681** Ensure start and end dates are respected on mobilePickDate on Android

## LiveCode Community IDE changes

### Specific IDE bug fixes (9.0.2-rc-1)

- 14079** Ensure subscripts and superscripts can be set more than once
- 17683** Ensure Start Center stays open when a Plugin opens on startup
- 21245** SE indent errors with inline block comments and line continuation
- 21418** Ensure arrays with comma in the key name are displayed correctly in the variable viewer window
- 21430** Ensure arrowKeys work correctly when editing a control's name in the Project Browser
- 21528** Ensure graphics can be reshaped more than once from the Object menu
- 21580** Make button "show grid" toggle
- 21585** Make height of sample graphics in PI-> Effects stable

## LiveCode Community extension changes

### Specific extension bug fixes (9.0.2-rc-1)

- 21428** Allow specifying the min and max version number in qrCreate

- 21503** Prevent accidental value removal on key addition
- 21567** Prevent error when hilitedElement set to empty

## LiveCode Indy extension changes

### Specific extension bug fixes (9.0.2-rc-1)

- 21399** Improve `AWSS3GetBucket` documentation to clarify results when only a single object is returned
- 21402** Fix `AWSS3PutBucket` for regions other than `us-east-1`
- 21419** Remove `pParameters` param from `AWSS3DeleteObject`
- 21421** Fix signing of `AWSS3GetService`
- 21429** Fix signing when multiple parameters are included in a query string

## LiveCode Business extension changes

### Specific extension bug fixes (9.0.2-rc-1)

- 20942** Improve remove debugger script cache clearing between debug sessions

## LiveCode builder changes

### Specific builder bug fixes (9.0.2-rc-1)

- 21507** Fix incorrect parameter order in `com.livecode.math atan2` function

## Previous release notes

- [LiveCode 9.0.1 Release Notes](#)
- [LiveCode 9.0.0 Release Notes](#)
- [LiveCode 8.1.9 Release Notes](#)
- [LiveCode 8.1.8 Release Notes](#)
- [LiveCode 8.1.7 Release Notes](#)

- [LiveCode 8.1.6 Release Notes](#)
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