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Script Writing For Runtime

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Comments, questions and suggestions are welcome!

About UserLand Frontier

UserLand Frontier is a scripting system that makes it easy to write utilities that customize and automate the Macintosh operating system, file system, networks and integrate the capabilities of Apple Event-aware application software.

Frontier is a powerful script writer's tool. If you have experience writing dBASE or 4th Dimension applications, BASIC programs, HyperCard stacks, or spreadsheet macros, you can probably easily learn how to write Frontier scripts.

Runtime is for people who want to use scripts. Script writing requires a commitment to understand some of the inner-workings of the Macintosh operating system. We've simplified and streamlined Frontier script writing as much as possible, but we have not hidden the substantial power of the Macintosh operating system.

Frontier is a commercial product, carried by retailers and mail order resellers. Runtime is an inexpensive shareware application.

This document contains information that helps Frontier script writers produce scripts that work with Runtime.

What Runtime Can Do

Running scripts

Basically Runtime's job is to run all kinds of scripts and act as a menu sharing server and Apple Event server.

Runtime's main window

Runtime's main window displays status information, including the user's name, the amount of available memory, the number of scripts currently running.

It also has room for a message. When your script calls the built-in msg verb, its string parameter is displayed in this part of the Frontier Runtime window.

Object Database

Just like Frontier, Runtime has an object database. Scripts can assign to values, refer to them, or send them as part of Apple Event messages.

Runtime.root has a system.startup table to run scripts that launch when Runtime is launched.

Runtime.root has a new table, system.runtime, which holds scripts and data that are unique to the Runtime environment.

fileMenu.save

The fileMenu.save verb works in Runtime. Your scripts should call it when you've made a change to the object database and you want to be sure that the result is safe on disk. Don't overdo it though. One call to fileMenu.save is probably enough for each script.

Dialogs

All the modal dialog verbs work, so your scripts can interact with users. Modeless dialogs (dialog.runModeless) are not supported in Runtime.

It's a menu sharing server

Menu bars edited in Frontier can be loaded into Runtime to be served to applications that support the menu sharing protocol. Runtime itself is menu sharing-aware, so commands can be added to its menu bar by installing a menubar object at system.menubars.LAND.

It’s an Apple Event server

Thru the system.verbs.traps table, script writers can program a wide variety of (network) server applications that are supported by Runtime.

Agents

Any script in the system.agents table is run as a background process. However, Runtime’s support for agents is simpler than Frontier’s.

Frontier has a popup menu that allows the user to control which agent displays its messages in the main window. To conserve memory, Runtime has no such popup, so if more than one agent process is displaying messages in the main window, they will overwrite each other. Agents designed to be used with Runtime should be cautious about using the built-in msg verb to display information.

Only agents that are present when Runtime starts up will run. Adding or deleting an agent script while Runtime is running does not cause a new agent to run or an existing agent to stop running.

As in Frontier, cmd-period cannot be used to kill an agent. Once launched, an agent will only stop running if an error is encountered or when Runtime quits.

Another difference is that Runtime executes all agents in parallel, while Frontier runs them sequentially. This means that the overhead of running multiple agents is greater in Runtime, but if one agent takes a long time to execute it will not prevent other agents from running more frequently.

Extra Capabilities of Frontier

Overview

There are features found in Frontier that are not found in Runtime. This was necessary because the goal of Runtime was to produce as small an application as possible, to provide security for scripts and the object database, and to hide details from users who don't want to get involved in script writing.

This section describes the extra capabilities that are available in Frontier that are not available in Frontier Runtime.

Five Editors

Frontier includes five editors for managing data stored in the object database:

- **The table editor interactively manages the hierarchy of disk-based symbol tables that Frontier scripts operate on.**
- **The script editor allows you to edit and debug outline-based scripts.**
- **The menu bar editor is used to design and customize structures of standard Macintosh menus. Each command in a menu can have a script linked to it, edited by the script editor.**
- **A built-in word processor that edits and displays rich word processing text.**
- **The outline editor allows you to edit hierarchic structures of text and data.**

These editors are not available in Runtime. And since Frontier scripts can drive all these components, the verbs used to manipulate these editors in Frontier are not present in Runtime.

Another way of saying the same thing: Runtime can only open one window, the main window. Users can select commands from Runtime's menu bar and interact with dialogs, but otherwise there are no interactive features in Runtime. The user can't edit things, and neither can scripts.

Suites

Runtime has a simpler model for menubar management than Frontier. Only one user-editable menu can be displayed in Runtime's menu bar, the one stored at system.menubars.LAND. Therefore Frontier suites which display a menubar won't work in Runtime.

Other suites, such as the backup suite and the states suite, don't display menubar objects and therefore work fully in Frontier Runtime.

Script Writing for Runtime

Frontier.isRuntime

In many cases, no special provisions need to be made for a script to run with either Frontier or Frontier Runtime. However, in some cases you may want to disable features of your scripts to allow them to work in either UserLand environment. In those cases, you should use the new built-in Frontier.isRuntime verb which returns true if the script is being run by Runtime, false if it's being run by Frontier.

For example, here's what the updated version of export.importer does when it has finished bringing a new object into the database:

```
if not Frontier.isRuntime ()
    edit (adr) «show the newly imported object
```

Since Runtime can't open a window displaying an object, it makes sense to only do this if the script is being run by Frontier.

Runtime is a menu sharing server and a client

When Runtime is running, there are two built-in menus: the menu and the File menu. You can also add menus to Runtime's menubar by editing the menubar object at system.menubars.LAND.

But don't overdo it. Lean towards adding commands to menu sharing-aware apps or desktop scripts or droplets. Use the FinderMenu package to add commands to the Finder's menu bar. We'd like to keep the Frontier Runtime menu bar as simple as possible.

Working in Runtime.root with Frontier

Since much of the functionality of Frontier is implemented in scripts, and many of those scripts are not present in Runtime.root, it can be awkward using Frontier to edit Runtime.root. Here are some tips and suggestions to make things work for you:

1. **Do it as little as possible. Use Frontier to develop desktop scripts, droplets and shared menu scripts and then export them using the appropriate command from the UserLand/Export menu. Test your exported scripts by dragging and dropping the export files on the Frontier Runtime application. We have included several scripts in the "For Frontier 1.0 Users" folder that streamline the exporting of information from your Frontier.root to the Runtime.root file.**

2. **Use Copy & Paste. A lot of people don't know that Frontier can have more than one "root" file open at a time. To move objects from Frontier.root to Runtime.root, open both files, and use Copy/Paste to move information from one root to another.**

   To paste an object into the same (valid) location from which it was copied in Frontier.root, paste it into Runtime.root's main window instead of navigating to the matching table.

3. **Check out the Scripting menu. We've put a few commands into that menu that will help make life a little easier when editing Runtime.root with Frontier.**

New release of Droplet Developer

We've had to make a couple of improvements to the Droplet Developer Kit to accommodate for Frontier Runtime. The new release is 2.0. Be sure to download this new version before producing any new droplets, or to upgrade existing droplets to work with Frontier Runtime.

UCMDs & XCMDs

Frontier 2.0 code extensions work in Runtime exactly as they do in Frontier. Check out the "UCMDs & XCMDs" folder in Frontier SDK 2.0 for details.

We're available for consultation

Send us a public email at GO USERLAND on CompuServe or the UserLand Discussions board on AppleLink. We're happy to help you get your scripts working with Runtime.

Verbs that work in Runtime

Here’s a list of verbs that work in Frontier Runtime:

- all basic verbs except edit, close, timeCreated & timeModified, runSelection
- app verbs
- clipboard verbs
- clock verbs except clock.timeStamp
- core verbs
- date verbs
- dialog verbs except dialog.runModeless
- file verbs
- fileMenu.save, fileMenu.quit
- Finder verbs
- Frontier verbs except Frontier.enableAgents
- kb verbs
- launch verbs
- menu.addMenuCommand, menu.deleteMenuCommand
- misc verbs
- point verbs
- rectangle verbs
- rgb verbs
- required verbs
- rez verbs
- script.compile, script.unCompile
- speaker verbs
- string verbs
- sys verbs
- table.assign, table.copy, table.copyContents, table.emptyTable, table.move, table.moveContents, table.moveAndRename, table.rename, table.surePath, table.uniqueName, table.visit

Here’s a list of verbs that only work in Frontier:

- edit, close, timeCreated & timeModified, runSelection
- clock.sleepFor
- dialog.runModeless
- editMenu verbs
- fileMenu.close, fileMenu.closeAll, fileMenu.new, fileMenu.open, fileMenu.print, fileMenu.revert, fileMenu.saveCopy
- Frontier.enableAgents
- mainWindow verbs
- menu verbs except menu.addMenuCommand, menu.deleteMenuCommand
- mouse verbs
- op verbs
- pict verbs
- script verbs except script.compile, script.unCompile
- search verbs
- table.getCursor, table.go, table.goto, table.gotoAddress, table.gotoName, table.promptNewItem, table.sortBy, table.validate
- target verbs
- window verbs
- wp verbs