

Fixity

Fixity User Guide Version 0.2 2013-11-22

Contact information

AudioVisual Preservation Solutions
<http://www.avpreserve.com>

GitHub repository

<https://github.com/avpreserve/fixity>

Download pages for application

Windows

<http://www.avpreserve.com/wp-content/uploads/2013/10/fixity-win.zip>

Mac

Coming Soon

Note

This application is in beta. Please help refine it further by reporting all bugs to
<https://github.com/avpreserve/fixity/issues>

Changelog

2013-11-22 Version 0.2

- Addressed bug with scheduling issue – task was not generated properly if the file path had a directory with spaces in it.
- Addressed bug with emailing of reports – corrected SMTP configuration
- Changed the code for images so that they display properly
- Moved AutoFixity.exe into schedule folder to avoid confusion

- Other minor code refinements
- Updated User Guide according to user feedback

Brief overview and background

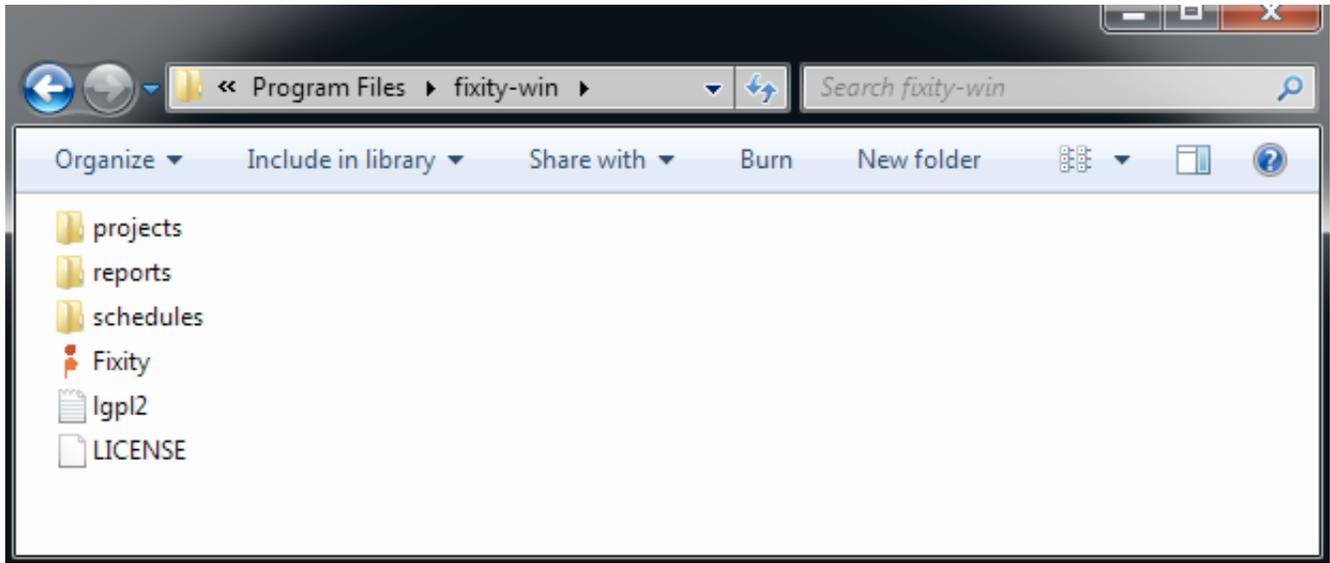
Fixity is a utility for the documentation and regular review of stored files. Fixity scans a folder or directory, creating a manifest of the files including their file paths and their checksums, against which a regular comparative analysis can be run. Fixity monitors **file integrity** through generation and validation of checksums, and **file attendance** through monitoring and reporting on new, missing, moved and renamed files.

AVPreserve created Fixity after coming to the realization that:

1. Checksum generation and validation are universally recognized as a primary mechanism for fulfilling the goal of fixity.
2. Generating checksums without systematically and routinely validating them is of little or no use.
3. Most organizations that “use checksums” only generate checksums but don’t validate them routinely, if at all.
4. The primary reason organizations don’t systematically and routinely verify checksums is because there is no tool that allows scheduling and reporting of validation.
5. Organizations that do routinely verify checksums do not typically monitor and report on file attendance types of information.
6. Overcoming the lack of resources and/or access to IT expertise is a critical factor in enabling organizations to fulfill the goal of fixity. Organizations need a simple, low cost tool.

There are many free and open source checksum utilities out on the market, but they do not offer the feature set or simplicity necessary to fulfill the need that many organizations have. Fixity was created with the sole focus of fulfilling the requirements of those concerned with monitoring fixity of a collection over the long term. It is intended for use in monitoring collections of files that are “final state”, or ready for deposit into an archive or preservation oriented repository.

The Fixity folder



When you download Fixity, the executable files, as well as the folders for your future projects, reports, and schedules, are stored within the directory. This folder must stay formatted as-is; if you move the “Fixity.exe” file from that folder, the program will not function. If you wish, you can create a shortcut to the executable file in a more convenient location.

Note: The AutoFixity.exe file located in the *schedules* folder is invoked during the scheduled run of Fixity, and does not need to be run manually. It should stay in place and should not be executed via double-clicking.

Fixity file menu

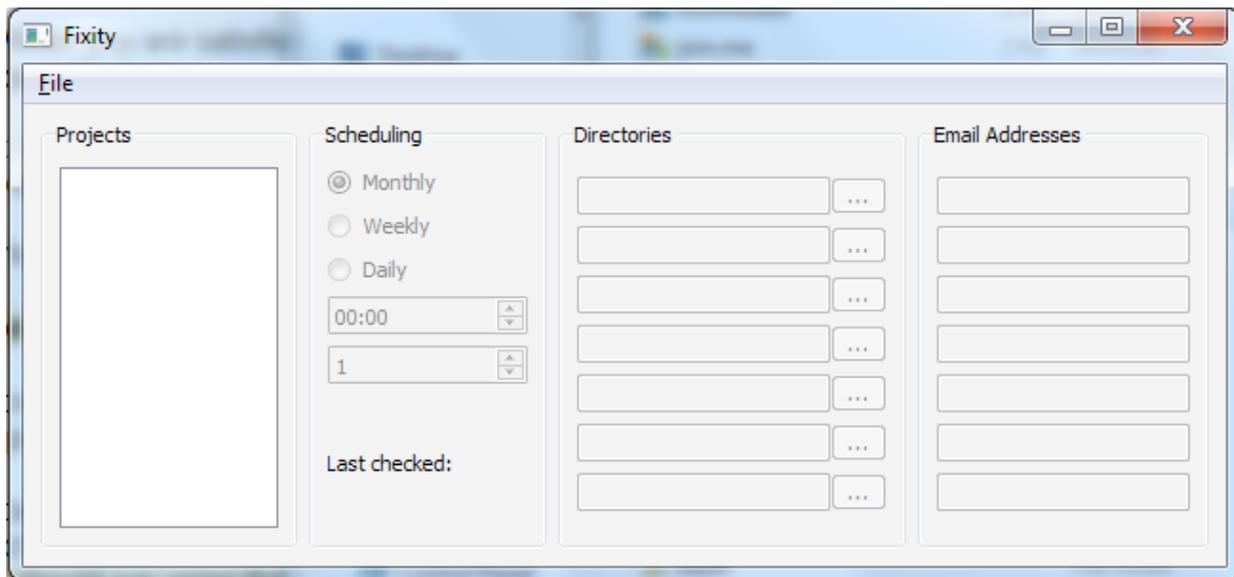
New Project: Choose this option each time you wish to set up a new project. A project contains the settings for scheduling, directories and email addresses, all discussed below. You will be prompted to name your project.

Save and Run: When you are satisfied with your project's parameters, click this option to save it to your project file folder. This will also begin the process of generating checksums and file attendance information for all directories selected for monitoring.

Save Email/Time: If you wish to quickly and easily change a project's schedule or email recipients without changing its directories, use this function.

Delete Project: Choose this option if you wish to delete a project completely.

Fixity interface



Projects: As you create new projects, the project names you have chosen will appear in this box. Simply click on a project name to view its settings in the rest of the window.

Scheduling: You can set the schedule for validating checksums and file attendance in this section. Using the radio buttons, you can choose between a monthly, weekly, or daily scan.

- **Monthly:** If you choose this option, you will be presented with two boxes. The box containing “00:00” is where you enter the time (in military time and in reference to the date and time settings of your computer) that you want the validation to begin. The second box scrolls through numbers from 1 to 31, allowing you to choose the day of the month you wish the scan to run.
- **Weekly:** If you choose this option, you will be presented with two boxes. The box containing “00:00” is where you enter the time (in military time and in reference to the date and time settings of your computer) that you want the validation to begin. The second box allows you to choose the day of the week you wish the scan to run.
- **Daily:** If you choose this option, you will be presented with one box. This box is where you enter the time (in military time and in reference to the date and time settings of your computer) that you want the validation to begin each day.

Lastly, in the **Scheduling** column, Fixity displays the date and time of your project’s most recent scan.

Note: Fixity will not run when the computer is off and it will not automatically start missed scans when the computer is turned back on. In this scenario, you must manually start a scan or wait until the next scheduled scan to run. Fixity can, however, run multiple validations in parallel.

Directories  : Click on this button to select the specific directory that you wish to scan.

You can select up to 7 per project.

Email Addresses: Every time Fixity scans a directory, a report is generated. In each of your projects, you can choose to have this report sent to up to 7 different email addresses each time a test returns with errors. Simply enter one email address in each of the seven fields underneath *Email Addresses*. Please note: An email report is only sent when there are changes present. See the “Fixity Project Report” section below for Fixity’s definition of a change.

Fixity project report

	A	B
1	Fixity report	
2	Project name	New_Project
3	Algorithm used	sha256
4	Date	2013-10-27
5	Total files	46
6	Files confirmed	45
7	Files moved	0
8	Files created	0
9	Files corrupted	1
10	Files missing	0
11	FAILURE	<u>C:\Users\AVPS-Alex\Desktop\bag\bag-infoa.txt</u>
12	CONFIRMED	<u>C:\Users\AVPS-Alex\Desktop\bag\bagit.txt</u>
13	CONFIRMED	<u>C:\Users\AVPS-Alex\Desktop\bag\manifest-sha256.txt</u>
14	CONFIRMED	<u>C:\Users\AVPS-Alex\Desktop\bag>tagmanifest-sha256.txt</u>

Whenever Fixity performs a scan and changes are found, it generates a tab delimited .csv report. Changes include:

- The checksum value of a file changing since the last scan
- New files being added that weren’t there since the last scan
- Existing files being removed since the last scan
- Files being moved since the last scan
- Files being renamed since the last scan

The report that is generated is saved to the “reports” folder and emailed to any email addressed identified in the project. Please note that if a scan runs with no changes, no emails are sent. However, you can verify when the last scan was performed within the interface of Fixity by looking at “Last Checked”.

A note on behavior upon finding changes

When changes are identified, Fixity behaves in the following ways:

- New files are added to the manifest and checksums are generated for them
- Removed files are removed from the manifest
- Moved files are updated with their new location in the manifest
- Renamed files are updated with their new name in the manifest
- Corrupted files are marked as such in the manifest and are not updated in the project file. They will remain as corrupted files in the project file until they are removed or a new project file is created. We imagine a simpler future scenario, but currently, to zero out changes found, you must delete your project file and create a new one.

These behaviors are critical to recognize and understand for the proper interpretation and response to reports. If the changes that are identified in a given report are purposeful and expected then doing nothing in response is good. If changes that are identified in a given report are **not** purposeful and expected then correcting them will result in changes being identified in the next report.

Frequently asked questions

Q: Will Fixity perform a scheduled scan if the application is not open?

A: Yes.

Q: Will Fixity perform a scheduled scan if the computer is turned off?

A: No.

Q: If a Fixity scan is missed because the computer is turned off will it automatically begin when the computer is turned on again?

A: No, a scan will not be performed until the next scheduled scan

Q: What is the .fxy file in the project directory?

A: The .fxy file found in the project directory contains the information for a given project. There is no need to alter the file directly – it should only be edited via Fixity.

The structure of the .fxy file is as follows:

Root directories to scan
Email addresses to alert
Schedule information
Date and time of last run
File checksum File path File inode

More information on these values can be found in the program source code.

Q: How is scheduling performed within Windows?

A: Fixity uses Windows' SCHEDULE tasks with AutoFixity to set/update/delete scheduled tasks. As such, its behavior is best explored via the SCHEDULE documentation.