

Exactly User Guide

Version 0.1.4 2017-02-07

Contact information

AVPreserve | <http://www.avpreserve.com/>

GitHub repository

<https://github.com/avpreserve/uk-exactly>

Download pages for application

Windows (32bit)

<https://www.avpreserve.com/wp-content/uploads/2017/02/exactly-0.1.4-32bit.zip>

sha256: bf916dca884a3a0405194d44c1e2b997b3b01828dc8d682f82523d1f9e6c23b8

Windows(64 bit)

<https://www.avpreserve.com/wp-content/uploads/2017/02/exactly-0.1.4-64bit.zip>

sha256: e5396f33e4eb61090bf630c8326d532980335ad12b4d786ecba8a2c72647b172

Mac

<https://www.avpreserve.com/wp-content/uploads/2017/02/exactly-0.1.4-mac.zip>

sha256: 96f2ceea4dc12f3625d4d7732d2d49ca7ff2b3b4685e7bc5402c3cc7bcca30f3

Java (Jar) *[now found in the Windows download package]*

<https://www.avpreserve.com/wp-content/uploads/2017/02/exactly-0.1.4-32bit.zip>

<https://www.avpreserve.com/wp-content/uploads/2017/02/exactly-0.1.4-64bit.zip>

Note: This application is in beta. Please help refine it further by reporting all bugs to

<https://github.com/avpreserve/uk-exactly/issues>.



Change Log

2016-01-13 Version 0.1

- First release.

2016-03-01 Version 0.1.1

- Update bug that adds “.zip” Bag Name in Exactly TransferComplete Report when a bag is zipped as part of the transfer process. Bag Name now remains the same as what the user entered into the Exactly UI.
- Update look and feel of Export/Import pop-up windows on Windows version of Exactly.

2016-05-13 Version 0.1.2

- Improved FTP performance for FTP servers that frequently disconnect during the transfer session. Fix was tested against BrickFTP.com because of common failures by users using this service.
- Fixed a Microsoft Email Exchange issue.
- Added new feature to capture original file system information for transferred files as an additional text document: FileSystemData.txt. Exactly uses a directory listing on Windows and the “stat” command on MacOS to extract original create/modify/access dates, owners/groups, and file paths before packaging targeted files for delivery.

2016-10-03 Version 0.1.3

- Added SFTP option for package delivery. New SFTP preferences page allows users to test and save SFTP delivery credentials. Users can select SFTP as preferred method for delivery of files during any transfer.
- Fixed an error in FileSystemData.txt file creation caused when filenames include reserved characters or spaces.
- Fixed an error where Exactly changed filenames when reserved characters (such as colons “:”) appear. Now Exactly will report an error to the user and request for the user to rename the file before proceeding.

2017-02-03 Version 0.1.4

- Adjusted codebase of Exactly to adjust for delayed database initiation and application initiation within the new Mac OS: Sierra.
- Made corrections to email code logic to reduce java exceptions when sending mail for users.
- Added data element in TransferComplete.txt to note the email address of the user and the email address(es) of the recipients.

Known Issues

- Exactly does not support ftps as a delivery method at this point.
- Current version attempts to capture original timestamps for files as they are copied from the storage environment of origin to the destination environment. This feature is under development and will likely change as users provide feedback.

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Brief Overview and Background

Exactly is a simple and easy to use application for remotely and safely transferring any born-digital material to the archive. Exactly is a user-friendly application that utilizes the BagIt File Packaging Format (an Internet Engineering Task-Force standard, developed by the Library of Congress and the California Digital Library, with current support from George Washington University and the University of Maryland), supports FTP transfer, as well as standard network transfers, and integrates into desktop-based file sharing workflows such as Dropbox or Google Drive. Additionally, Exactly allows the archive to create customized metadata templates for the donor to fill out before submission. With structured metadata coming into the archive with the digital object, the accessioning process will be a quick importing activity. Exactly can send email notifications when files have been delivered to the archive. Exactly is addressing one of the Nunn Center’s greatest workflow challenges, but also one of the greatest challenges facing any archive working with born-digital material.

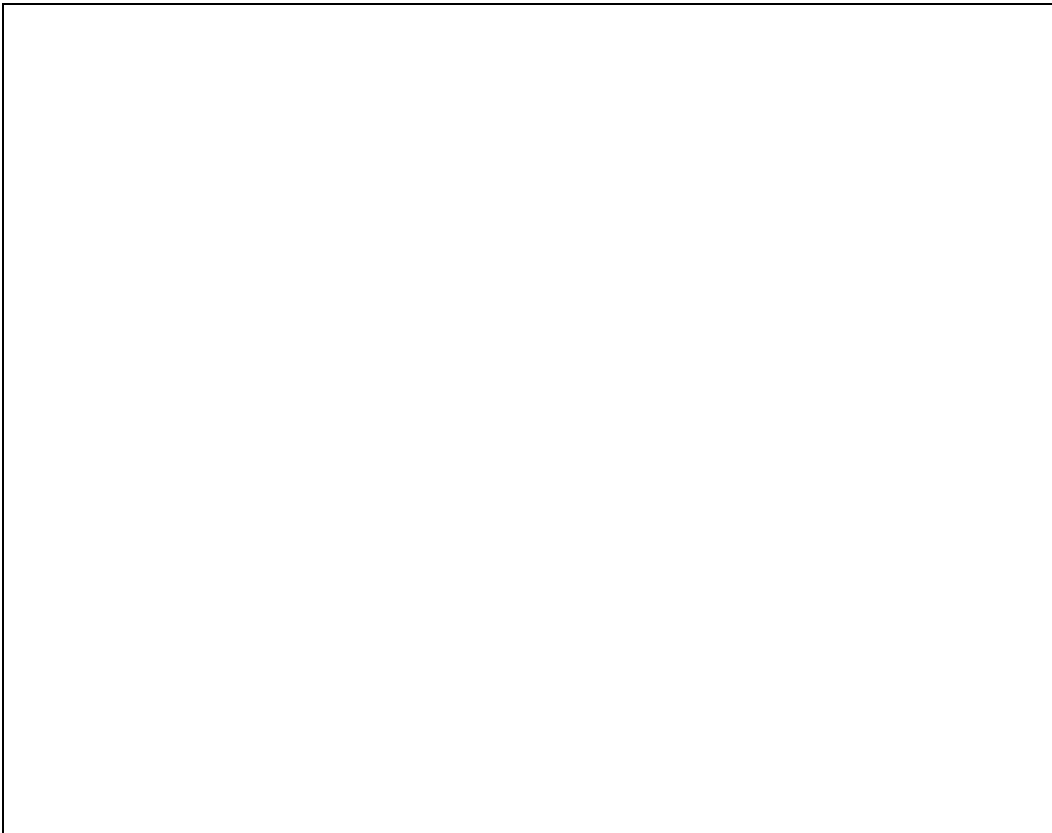


Figure 1: Exactly user interface.

Installing Exactly

Exactly can be installed as a Mac OS Build (application file), a Windows executable file (.exe), or as a Java package (.jar). Download links for each option can be found on the cover page of this user guide above.

Mac OS Build

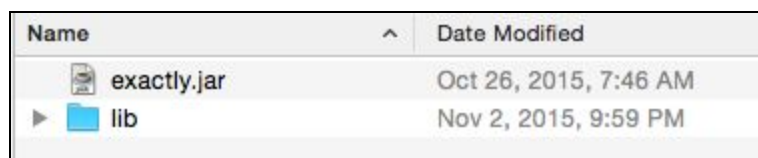
Once unzipped, the Mac OS package can be moved to your applications folder. Opening the Exactly folder, you will see an Exactly application file. Simply open the application file and it will run as any application runs on your Mac. *If it is your first time opening the application, right click on the application file and choose “Open.” The pop-up will ask you if you are sure you want to open the application. Choose “yes.”

Windows Executable

Once unzipped, the Windows Executable (.exe) can be opened from anywhere you choose to store the file. Every time you open the application it will ask you if it is alright to install the application on your computer. Because this is a java application, Exactly comes complete with the necessary java files to run on your Windows machine. Exactly will install those files in a local temp area while the application is running.

Java Package

When you download and unzip the Java version of Exactly, the executable files, as well as the log files, are stored within the parent directory.





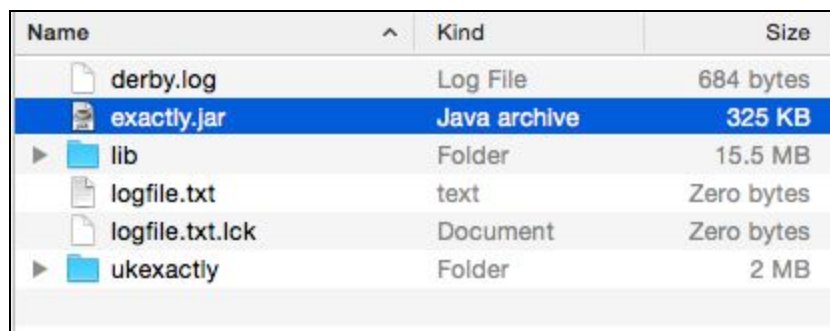
Name	^	Date Modified
 exactly.jar		Oct 26, 2015, 7:46 AM
 lib		Nov 2, 2015, 9:59 PM

Figure 2: Exactly directory structure before opening the application for the first time.









Name	^	Kind	Size
 derby.log		Log File	684 bytes
 exactly.jar		Java archive	325 KB
 lib		Folder	15.5 MB
 logfile.txt		text	Zero bytes
 logfile.txt.lck		Document	Zero bytes
 ukexactly		Folder	2 MB

Figure 3: Exactly directory structure after opening the java application for the first time.

This directory can be placed anywhere on your computer but it must stay formatted as-is; if you move exactly.jar or any of the directories from the parent folder the program will not function. On a Mac, the log and reports folders will be created in the same directory as the app the first time the application is run. Do not rename exactly.jar to any other name or the program will not function properly. If you wish, you can create shortcuts to the executable file and directories in a more convenient location.

Within the parent directory you will find the following subdirectories:

- **lib**: Contains all java scripts for the application.
- **ukexactly**: Contains all database files and configuration settings for the database — these files/folders cannot be changed or the program will not function correctly.

To open the java version of Exactly, you can double click the **exactly.jar** file. If this is the first time you open the .jar file you on a Mac you will need to right-click and select “Open”. A dialogue box will open and ask if you want to open the file; select “Open”. When the application opens, the default view for Exactly is the *Transfer Center* as seen below.

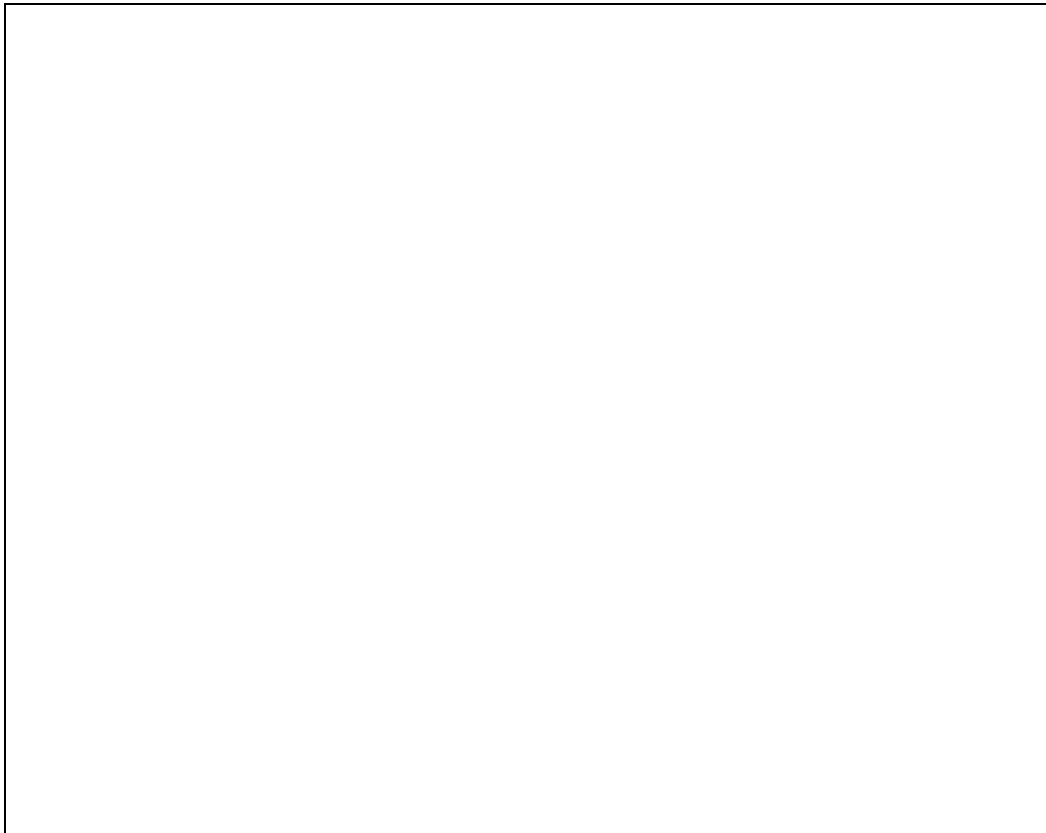


Figure 4: The Transfer Center

Exactly Interface

Deliver

Exactly has a graphical user interface (GUI) called the *Transfer Center*. The following text and images detail the behaviors of each section of the interface starting with the “Deliver” tab.

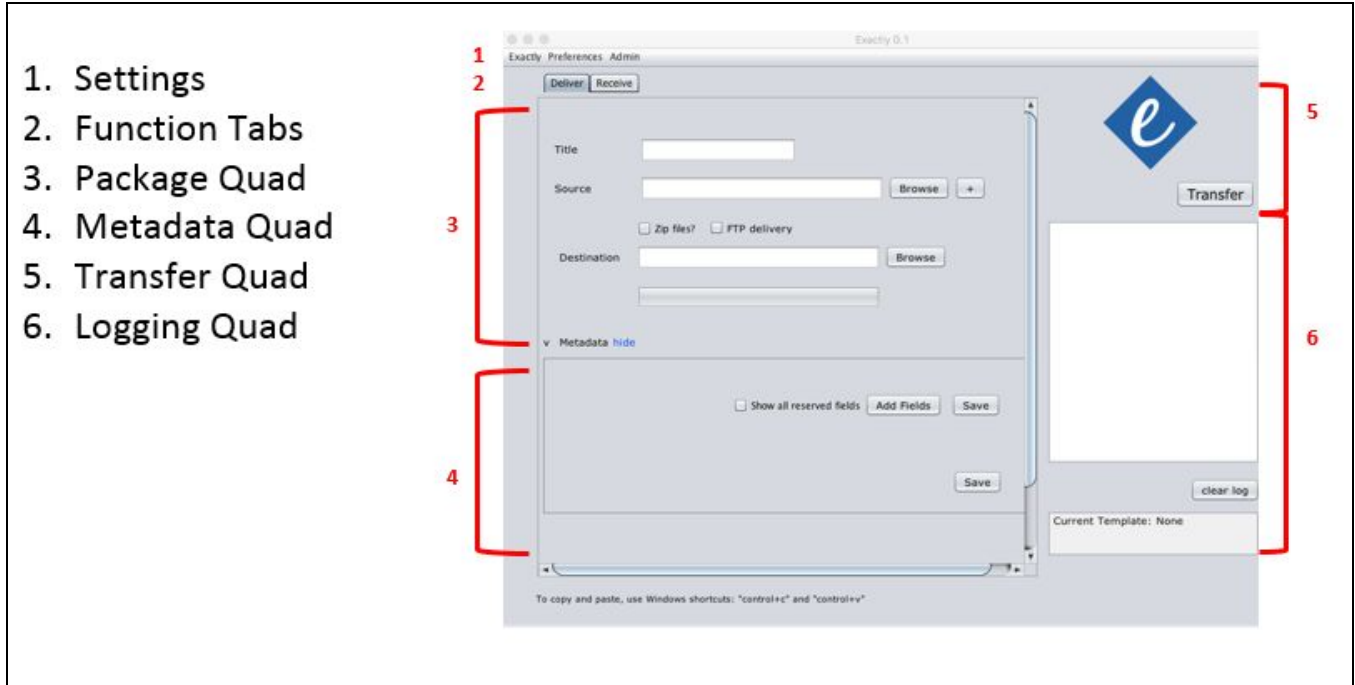


Figure 5: The Transfer Center (Deliver)

The Package Quad

The large upper left-hand box in the application houses the main configuration elements for creating a package for transfer.

Title: The user can name the package. This will be the name given to the highest-level directory that will hold all the contents of the package when it is created.

Source: The user can browse directories and/or files that will be included in the package. Use the “+” sign to select additional directories and/or files to include. Select multiple files or directories in the browse window in order to add more than one selection at once.

Zip files: This check box allows the user to serialize the package into a single zipped file. If selected, the package will be zipped.

FTP delivery: This check box allows the user to designate that the transfer will make use of the FTP configuration settings to deliver the package to a recipient’s FTP server. Exactly will still create a local copy of the package first before attempting to deliver the package via FTP. The

Destination field must be filled out. And the FTP Settings must be validated before Exactly will deliver via FTP.

Destination: The user can browse directories in order to determine the local destination where Exactly will deposit the package. Exactly will create a new directory at the destination and the new directory will be named with the value that is set in the “Title” field.

The Metadata Quad

By default, the metadata details are hidden from the user (unless the user has loaded an Exactly configuration template). To reveal the metadata details, the user can click on the word “show” just to the right of the Metadata label.



Figure 6: Revealed metadata details.

In essence the Metadata details area is composed of a user-definable set of key:value pairs that will be included in the package as bag-info.txt (.xml and .csv, as well) as metadata for the entire package. Users can select all BagIt reserved fields by selecting the “Show all reserved fields” check box. Metadata fields can be removed by selecting the “-” sign next to each label of a key:value pair. Metadata fields can be added by selecting the “Add Fields” button.

When a field is added, users can define the “label” and the “value” for each key:value pair. The “label” is the name of the metadata field; the “value” is the actual content of the field. Users can add as many fields as needed. In order for Exactly to recognize new fields, the user must select the “Save” button to save any changes or additions before completing the transfer.

Label fields have a limit of 256 characters. Value fields have a limit of 5,000 characters.

Label fields will be scrubbed to meet XML label character requirements.

Users can establish a metadata template by adding a set of predetermined labels with empty (or filled) values. After the user saves these values, the user can then export (using Exactly/Export) the configurations to share with other users. In this way users can create custom metadata schemas and share them for easy loading (using Exactly/Import).

The Transfer Quad

Once a user has completed at minimum a Title, Source, and Destination (all other elements are optional), the “Transfer” button initiates the packaging and transfer process.

On the right of the application, the log window communicates the ongoing activities of the tool and reports on success and failure. The “clear log” button clears the log window but does not clear the logfile.txt file that is in the Exactly folder. This log file contains a record of the current Exactly session and can be used for troubleshooting if Exactly is not performing as expected.



Receive

The main section of the “Receive” tab focuses on giving the recipient an opportunity to verify that the package is unchanged and complete, as well as to unpack the the package in order to move the contents out of the bagit structure and to a designated location.

The following text and images details the behaviors of the “Receive” tab.

The Transfer Center (Receive)

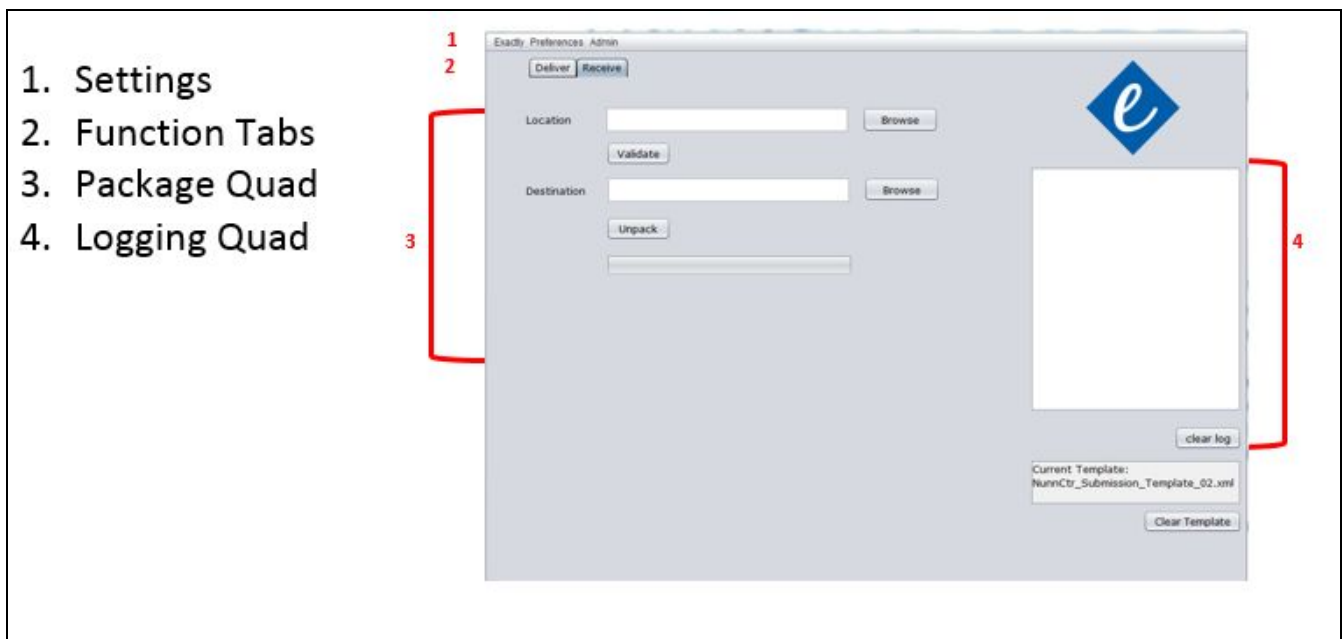


Figure 7: The Transfer Center (Receive)

The Package Quad

Location: The user can point Exactly to a directory that supposedly is the high-level directory of a BagIt bag, or to a zip file that contains a BagIt compliant bag. Once engaged, Exactly will investigate the location and determine whether the destination is indeed a compliant BagIt bag. In the log window, Exactly will display the results of this investigation and inform the user whether the target content is packaged in compliance with the BagIt specification.

Validate: If the target is recognized by Exactly as a compliant BagIt bag, then the user can select the “Validate” button to engage the BagIt library to perform a full verify to determine whether the target is (1) complete -- all files are present as expected and no additional payload files exist, and (2) valid -- all payload files’ checksums currently match the stored checksums in

the manifest-[algorithm].txt file within the package. The log window displays the results of the validation process.

Destination: If the user would like to remove the BagIt structure from the received package, a destination must be set for where Exactly will unpack the bag. Exactly will move the contents of the payload (i.e., the data directory) into a new directory labeled with the Title of the package at the designated destination.

Unpack: After a Destination is set above, the user can select the “Unpack” button to engage the process. Exactly will move the contents of the payload (i.e., the data directory) into a new directory labeled with the Title of the package. Additionally, Exactly will create a directory that includes the name of the bag and “_metadata.” Inside of this bag Exactly will place all bag-info.txt, bag-info.csv, bag-info.xml, manifest-md5.txt, and TransferComplete.txt files. The bagit.txt and the tagmanifest-md5.txt files will be deleted. Exactly performs a full BagIt verification before completing this process.

Exactly File Menu (Settings)

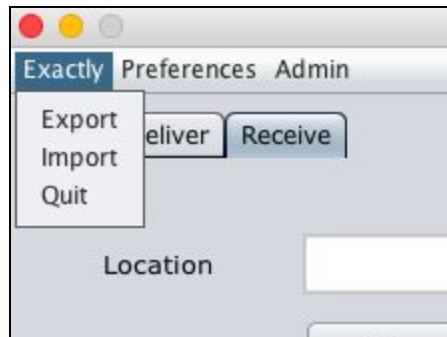


Figure 8: Detail of Exactly File menu.

Export

Choose this option each time you wish to create a snapshot of all current configurations in the Exactly GUI. Exactly will generate an XML configuration file and write it to the destination that you select. This XML configuration file will contain all settings, including Email Notifications, Email Settings, FTP Settings, and Metadata fields currently saved in the Metadata section. This XML configuration can be shared with colleagues, donors, or saved for reuse if you want to establish multiple FTP profiles.

Import

Select this option to load an existing XML configuration file into Exactly. Exactly will read the file and mimic all settings in the configuration file, including Email Notifications, Email Settings, FTP Settings, and Metadata fields depending on whether these are present in the imported configuration file. In the GUI, Exactly will display a notification of which configuration file is currently loaded (if any). Users can clear a loaded configuration template by selecting the “Clear Template” button in the Log Quad of the Exactly interface. This will reset the Exactly configuration settings to the previously saved settings before the configuration file was imported.

Quit

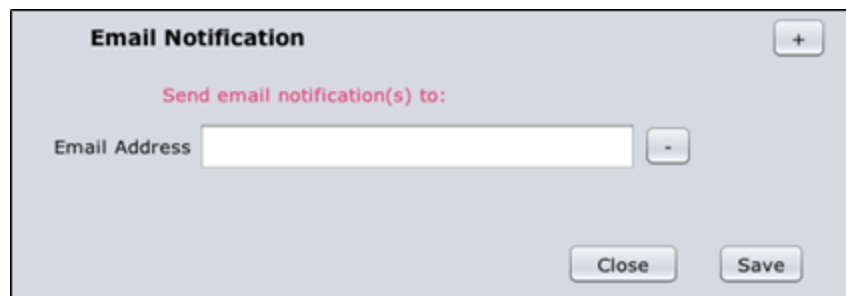
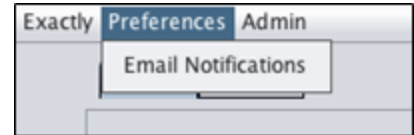
Choose the option to close the application.

Exactly Preferences Menu

Only one option exists in the preferences menu currently.

Email Notifications

Selecting this option will open a new page in the Exactly GUI. This page collects a list of recipient email addresses to which Exactly will send notification upon completion of a transfer operation. Select the “+” to open a new email address field. Users can add as many email addresses for notification as they would like. Simply select the “-” next to a given address to remove it. Select “Save” to save the addresses and/or any changes into Exactly’s internal database. When finished, select “Close” to return to the main Exactly GUI window.

A screenshot of the 'Email Notification' dialog box. The title bar reads 'Email Notification' with a '+' button on the right. Below the title, the text 'Send email notification(s) to:' is displayed in red. Underneath, there is a label 'Email Address' followed by a text input field and a '-' button to its right. At the bottom of the dialog, there are two buttons: 'Close' and 'Save'.

Note: Emails will only send if the “Enable Email notifications” box is checked on the **Email Settings** page.

Exactly Admin Menu

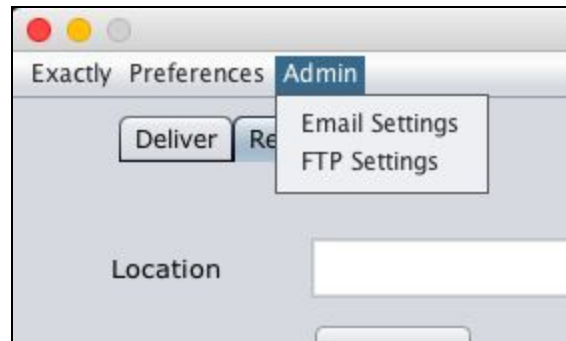


Figure 9: Detail of Exactly Admin menu.

Email Settings

Chose this menu to configure email settings for the Exactly application. Exactly will send emails on behalf of the Exactly user upon completion of a transfer operation.

A screenshot of the 'Email Settings' page in the Exactly application. The window title is 'Exactly 0.1' and the page header is 'Exactly Preferences Admin'. The page contains the following fields and options:

- Mail Server:** A text input field containing 'smtp.gmail.com'.
- User name:** An empty text input field.
- Password:** An empty text input field.
- Port:** A text input field containing '587'.
- Enable email notifications:** An unchecked checkbox.
- Encryption Method:** Three radio buttons: 'SSL Protocols' (unchecked), 'TLS Protocols' (checked), and 'None' (unchecked).

Below the fields, there is a pink text message: 'Provide smtp configurations for sending email.' At the bottom, there are two buttons: 'Close' and 'Check and Save'.

Figure 10: Detail of Exactly Email Settings page.

In Figure 10 you see how Exactly allows you to configure the email settings associated with the account used for emailing reports. Without setting this preference, Exactly will not be able to send report emails. Note that Exactly will encrypt the credentials before storing them in order to provide account security. By default, Exactly populates the server, port, and security fields with Gmail default settings. If these values are different for your email account (for example, if your email account is provided through your organization), you will need to provide the appropriate information. This is the same information you

would find in your email application configuration settings, so you may be able to obtain the information by looking at your email application account settings. If not, the information needed can be obtained from your email provider or by contacting your IT administrator.

You must select the “Enable email notifications” box and “Save” the configuration details in order for Exactly to send email notifications to the addresses (if any) that you added to the **Email Notifications** list in the **Preferences** menu.

The email account can be tested with the “Check and Save” button, which will report in the log window the results of the testing. If the account is verified, then Exactly will save the settings and report to you in the log window that it was able to check and save the settings correctly.

Anytime you need to make changes, be sure to select “Check and Save” again to update Exactly’s internal database.

Note: Users must be connected to the internet in order to “Check and Save” Exactly email settings.

FTP Settings

Choose this option to configure FTP settings for the Exactly application. If FTP settings are set, then Users can select “FTP” as a delivery option during a transfer operation. Users must be connected to the internet in order to set and use FTP settings.

The image shows a screenshot of a software window titled "Exactly 0.1" with a subtitle "Exactly Preferences Admin". The main content area is titled "FTP Settings" and contains several input fields: "Host", "Port" (with the value "21" entered), "Username", "Password", and "Destination". Below these fields is a "Data Connection Mode" section with two radio buttons: "Active" and "Passive", where "Passive" is selected. At the bottom of the dialog are two buttons: "Close" and "Validate and Save".

Figure 11: Detail of Exactly FTP Settings page.

In Figure 11 you see how Exactly allows you to configure the FTP settings that will be used to deliver content remotely to an FTP server if the User desires. Without setting this preference, Exactly will not be able to send packages via FTP. Note that Exactly will encrypt the credentials before storing them in order to provide account security.

The FTP connection can be tested with the “Validate and Save” button, which will report in the log window the results of the testing. If the connection is verified, then Exactly will save the settings and report to you in the log window that it was able to validate and save the settings correctly.

Anytime you need to make changes, be sure to select “Validate and Save” again to update Exactly’s internal database.

Note: *Users must be connected to the internet in order to “Validate and Save” Exactly FTP settings.*

Exactly Reporting

Exactly TransferComplete Report

After each Exactly transfer operation, Exactly will include a report “TransferComplete.txt” within the completed bag.



Figure 12. Example Exactly transfer report details.

Exactly’s transfer report documents the time and day of the transfer, the name of the transfer, the local destination, the FTP destination (if used), the email address of the current user (if email settings have been set), a count of the total files included in the transfer, and a count of the total bytes included in the package (this includes all reports and BagIt .txt, .csv, and .xml files).

Exactly Notification Email

After each Exactly transfer operation, if the User has enabled Exactly to send email notifications, Exactly will include the contents of both the “TransferComplete.txt” file and the “bag-info.txt” file within the text of the notification email. Additionally, a copy of the manifest-md5.txt file will be included as an attachment to the email. This gives the recipient a notification of the transfer, a snapshot of the transfer metadata, and a list of files and checksums to expect with the transfer.

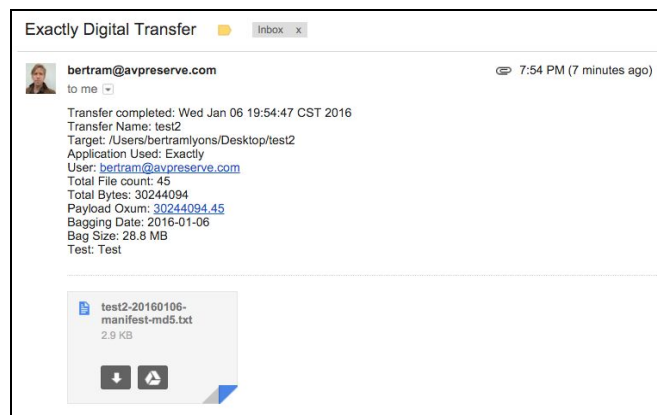


Figure 13. Example Exactly notification email.

Exactly Error Report

Receive Tab

Bag Recognition: Not organized in BagIt structure
Bag does not have any payload manifests.
Invalid bag
Invalid bag after coping to destination.

Deliver Tab

Please select Transfer destination.
Please provide Transfer name.
Folder already exists in destination with this title. Please change the title.
Please add at least one recipient.
Invalid bag after coping to destination.
FTP transfer failed.
An error occurred while uploading on FTP. Cannot upload file.
FTP transfer failed; local transfer completed successfully.
Issue while writing file.
Issue while updating tagmanifest-md5.txt
Error closing the bag.

Email Settings Tab

Credentials not valid. Please update Email Settings.

FTP Settings Tab

Credentials not valid. Please update FTP Settings.

Unknown Error

An error occurred. Please contact support.

Exactly Package Anatomy

At its heart, Exactly is a BagIt-compliant packager. It uses the bagit java library to create BagIt bags (see The BagIt File Packaging Format v0.97 at this URL, <https://tools.ietf.org/html/draft-kunze-bagit-12>, for definition of a BagIt bag).

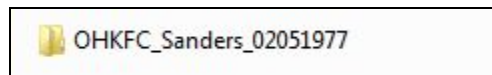
As a supplement to the standard elements of a BagIt bag, Exactly produces a report to document the transfer event (i.e., TransferComplete.txt) and transforms the bag-info.txt file into an XML and a CSV file for ease of use if users prefer XML or CSV for metadata imports.

Each Exactly package will be manifest as a directory or a zip file entitled with the “Title” given by the user during the Transfer preparation. This top-level directory is the packaging for the shipment. It is the equivalent of the box for shipping. All of the files and packing lists will be inside this directory.

The name given to this directory is generally considered to be the Title of the bag.

There is no standard naming practice for BagIt bags. A general guideline, though, is consistency and uniqueness, particularly if you are going to be using the bags for digital preservation in long-term storage. For example, at the Louie B. Nunn Center for Oral History at the University of Kentucky, for any given oral history interview, they include the project ID, the last name of the interviewee, and a date as the ingredients of their bag names:

[Project ID]_[Last Name of Interviewee]_[MMDDYYYY]



Within this directory (or within the directory once unzipped) will be the expected BagIt structure with a “data” directory that contains all the files and directories selected by the user for transfer.

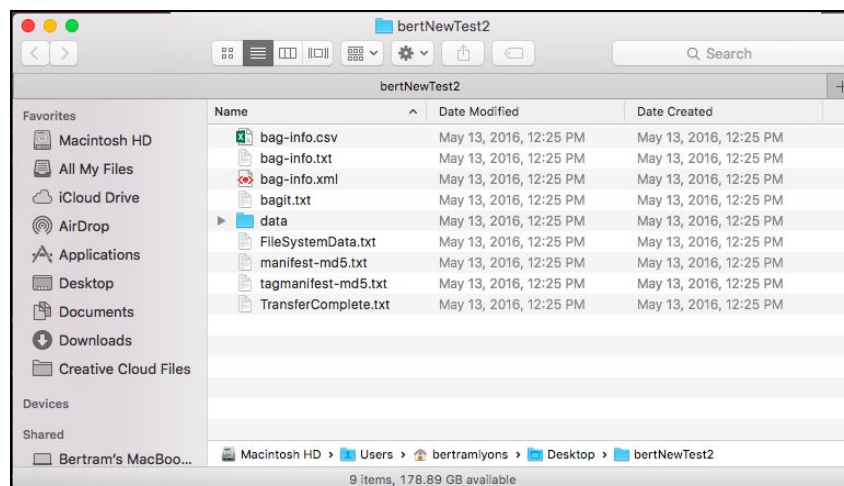


Figure 14. Example package structure.

Data Directory

The data directory holds all of the files you are planning to deliver. These files include metadata in any format, media of any type and accompanying Word or text documents. They can be single files or directories and multiple levels of subdirectories. This collection of files is collectively called the payload. During the Transfer process, you choose the files to be included in the payload and Exactly places them automatically in the data directory.

Bag-Info

The bag-info.txt file is a text file that is a lot like the shipping label on a physical package. It has information about who sent it and to whom it is going, as well as information about the bag generated in the bagging process. Exactly creates this file and uses the information you create in the Metadata Quad during the Transfer preparation process. Exactly creates a bag-info.txt, bag-info.csv, and bag-info.xml file for each package. These are just different ways of encoding the same set of information.

Bag-It.txt

The bag-it.txt file is another text file that Exactly creates with information about the bag itself. This is the bag declaration file that informs other systems that this package purports to be a BagIt bag. There is no need for the user to do anything with this file.

Manifest

The manifest-md5.txt file is a text file that is the equivalent of a packing list for shipping. This file is automatically generated and is an inventory of files in the payload along with their checksum.

A checksum is a type of digital fingerprint for a file. The validation process after transfer creates a new list of checksums and compares it to the old one. If the fingerprint of a file has changed, then something has been corrupted and a replacement needs to be requested. The validation process also checks the inventory to see if files were lost or added in the process. The most common type of checksum is MD5, which refers to the name of the algorithm that creates it. There are other types but for transfer and digital preservation, md5 is most widely used. The text of the file will look something like this ([checksum] [filepath]):

```
1fce6033e68ff6bc2a45da317ce9dbc3      data/qatar_2011_06.mrc
18b786ad6ebd2b0ae164023a2dc0e6d7      data/852 HLM.MRK
e9b9fd83898b46f77d65dd04063202ce      data/810 HLM.MRK
736790981dcf5ee4b93ffac8631e0809      data/25488/0001.tif
c6a7de1aa7c34ee4737502ad1aceaa7d      data/25488/0002.tif
```

Tag Manifest

The tagmanifest-md5.txt file is a text file automatically generated by Exactly that does not need to be edited by the user. It is used to lock all the bagit.txt, bag-info.txt, and manifest-md5.txt files in place, so that if they change we will know about it.

TransferComplete Report

As mentioned in the previous section, after each Exactly transfer operation, Exactly will include a report "TransferComplete.txt" within the completed bag.



Figure 15. TransferComplete.txt example..

Exactly's transfer report documents the time and day of the transfer, the name of the transfer, the local destination, the FTP destination (if used), the email address of the current user (if email settings have been set), a count of the total files included in the transfer, and a count of the total bytes included in the package (this includes all reports and BagIt .txt, .csv, and .xml files).

FileSystemData Report

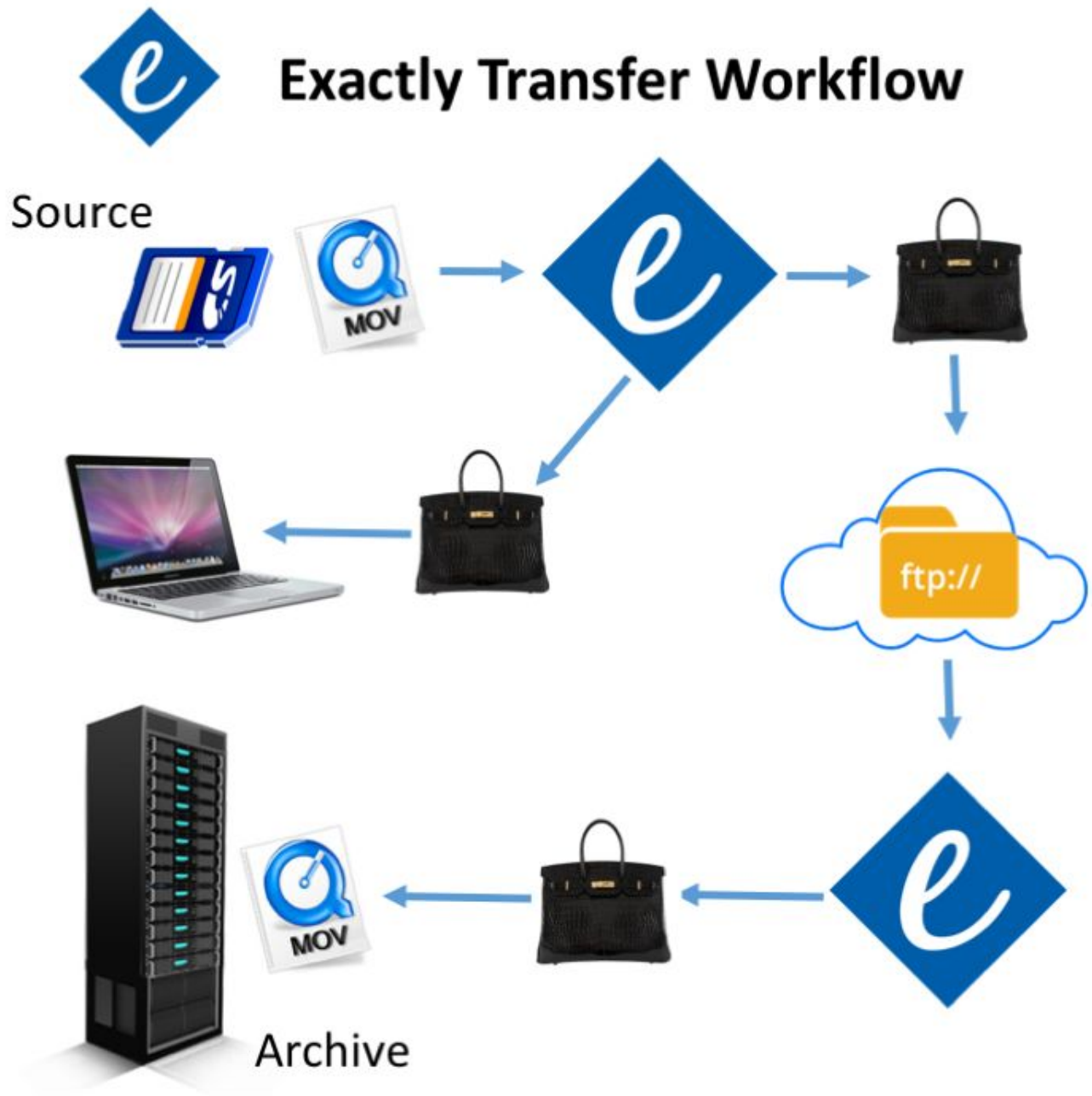
A new feature, currently in development, is that Exactly will attempt to capture the file system information for all targeted files before packaging the files for delivery.

```
FileSystemData.txt
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0043.mp4
16777220 18437679 -rwxrwxrwx 1 bertramlyons staff 0 61614695 "Apr 27 11:43:53 2016" "Nov 4 13:07:44 2014" "Nov 5 15:34:15 2014" "Nov 4 13:03:28 2014" 4096 120344
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0043.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0052.mp4
16777220 18437615 -rwxrwxrwx 1 bertramlyons staff 0 285872037 "Apr 28 12:58:40 2016" "Nov 4 13:18:40 2014" "Nov 5 15:34:14 2014" "Nov 4 13:03:04 2014" 4096 558344
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0052.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0053.mp4
16777220 18437809 -rwxrwxrwx 1 bertramlyons staff 0 285873113 "Apr 28 13:04:10 2016" "Nov 4 14:06:36 2014" "Nov 5 15:34:33 2014" "Nov 4 13:32:16 2014" 4096 558352
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0053.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0055.mp4
16777220 18437827 -rwxrwxrwx 1 bertramlyons staff 0 274704174 "Apr 27 11:43:57 2016" "Nov 4 14:05:46 2014" "Nov 5 15:34:40 2014" "Nov 4 13:32:30 2014" 4096 536536
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0055.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0065.mp4
16777220 18437497 -rwxrwxrwx 1 bertramlyons staff 0 274502008 "Apr 27 11:43:58 2016" "Nov 4 13:17:30 2014" "Nov 5 15:33:59 2014" "Nov 4 13:02:16 2014" 4096 536144
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0065.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0067.mp4
16777220 18437508 -rwxrwxrwx 1 bertramlyons staff 0 286930190 "Apr 28 13:04:01 2016" "Nov 4 13:19:12 2014" "Nov 5 15:34:07 2014" "Nov 4 13:02:46 2014" 4096 560416
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0067.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0069.mp4
16777220 18437857 -rwxrwxrwx 1 bertramlyons staff 0 291613269 "Apr 28 13:03:10 2016" "Nov 4 14:06:14 2014" "Nov 5 15:34:46 2014" "Nov 4 13:32:42 2014" 4096 569560
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0069.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0072.mp4
16777220 18437729 -rwxrwxrwx 1 bertramlyons staff 0 225030931 "Apr 27 11:44:02 2016" "Nov 4 13:59:58 2014" "Nov 5 15:34:21 2014" "Nov 4 13:31:52 2014" 4096 439520
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0072.mp4
/Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0041.mp4
16777220 18437486 -rwxrwxrwx 1 bertramlyons staff 0 279432618 "Apr 28 13:04:26 2016" "Nov 4 13:17:08 2014" "Nov 5 15:33:53 2014" "Nov 4 13:01:48 2014" 4096 545768
0 /Users/bertramlyons/Desktop/bertramlyons/AVPS/Resources/filesSamples/Ampatch/afc2004004_mv0041.mp4
```

Figure 16. FileSystemData.txt example, for MacOS.

On Windows, Exactly uses a directory list command (dir) and writes the output as a text file (FileSystemData.txt). On MacOS, Exactly uses a “stat” command (stat) and writes the output as a text file (FileSystemData.txt). This is a first attempt at supporting users’ requirements to keep original create/modify/access dates associated with files packaged and delivered by Exactly.

Exactly Workflow Maps





Exactly Transfer Workflow

