DDRescue-GUI Developer Documentation

Release 2.0.0

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Note: Most of the docstrings in this project don't follow any particular format at this time, and don't always provide helpful information. This will be remedied in due course.

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ONE

DOCUMENTATION FOR THE MAIN EXECUTABLE FILE (DDRESCUE_GUI.PY)

This is the main script that you use to start DDRescue-GUI.

class ddrescue_gui.DDRescue_GUI.**BackendThread**(*parent*)
Handles getting input from ddrescue during a recovery, and forwards it back to the GUI thread as required.

calculate_time_remaining()
Calculate remaining time based on the average read rate and the current amount of data recovered

change_units(*number_to_change*, *current_unit*, *required_unit*)
Convert data so it uses the correct unit of measurement

process_line(*line*)
Process a given line to get ddrescue's current status and recovery information and send it to the GUI Thread

run()
Main body of the thread, started with self.start()

class ddrescue_gui.DDRescue_GUI.**CustomTextCtrl**(*parent*, *wx_id*, *value*, *style*)
A custom wx.TextCtrl that provides features that are broken on Linux and macOS.

Features: A version of PositionToXY() that works on macOS. A version of XYToPosition() that works on macOS and fixed a bug on Linux. carriage_return(): Handles carriage returns correctly. up_one_line(): Moves insertion point up one line.

PositionToXY(*insertion_point*)
A custom version of wx.TextCtrl.PositionToXY() that works on OS X (the built-in one isn't implemented on OS X).

Note: Still not implemented on OS X on wxPython 4 (random numbers).

XYToPosition(*column*, *row*)
A custom version of wx.TextCtrl.XYToPosition() that works on OS X (the built-in one isn't implemented on OS X).

This is also helpful for LINUX because the built-in one has a quirk when you're at the end of the text and it always returns -1

carriage_return()
Handles carriage returns in output

up_one_line()
Handles '[A' (up one line) in output

class ddrescue_gui.DDRescue_GUI.**DiskInfoWindow**(*parent*)
DDRescue-GUI's disk information window.

bind_events()
Bind all events for DiskInfoWindow

create_widgets()
Create all widgets for DiskInfoWindow

get_diskinfo(*event=None*)
Call the thread to get Disk info, disable the refresh button, and start the throbber

on_exit(*event=None*)
Exit DiskInfoWindow

on_size(*event=None*)
Auto resize the list_ctrl columns

receive_diskinfo(*info*)
Get Disk data, call self.update_list_ctrl(), and then call MainWindow().update_file_choices() to refresh the file choices with the new info

setup_sizers()
Set up the sizers for DiskInfoWindow

update_list_ctrl(*event=None*)
Update the list control

class ddrescue_gui.DDRescue_GUI.**ElapsedTimeThread**(*parent*)
Keeps track of elapsed time during a recovery. A separate thread is used for this because wx.Timer wasn't working on macOS, and the BackendThread blocks if ddrescue pauses.

run()
Main body of the thread, started with self.start()

class ddrescue_gui.DDRescue_GUI.**FinishedWindow**(*parent*, *disk_capacity*, *recovered_data*)
This is displayed after a recovery is finished/aborted. Used to provide the user w/ options to restart the GUI, mount the output file, or close the GUI.

bind_events()
Bind all events for FinishedWindow

create_buttons()
Create all buttons for FinishedWindow

create_text()
Create all text for FinishedWindow

mount_disk()
Mount the output file

on_exit(*event=None*)
Close FinishedWindow and trigger closure of MainWindow

on_mount(*event=None*)
Triggered when mount button is pressed

restart(*event=None*)
Close FinishedWindow and call MainWindow().restart() to re-display and reset MainWindow

setup_sizers()
Set up all sizers for FinishedWindow

unmount_output_file(*event=None*)
Unmount the output file

class ddrescue_gui.DDRescue_GUI.**GetDiskInformation**(*parent*)
Used to get disk information without blocking the GUI thread. Calls parent.receive_diskinfo when info has ben retrieved.

get_info()
Get disk information as a privileged user

run()
Get Disk Information and return it as a list with embedded lists

class ddrescue_gui.DDRescue_GUI.**MainWindow**
DDRescue-GUI's main window.

add_line_to_output_box(*line*, *crs*, *uols*, *char_number*)
Adds a new line to the custom output box. Also handles calling carriage_return() and up_one_line() when required.

bind_events()
Bind all events for MainWindow

check_for_updates(*event=None*, *starting_up=False*)
Check for updates using the plist-formatted update file on my website. If some startup, only display info to the user if there was an update. Otherwise (aka requested by user), always display the information.

create_buttons()
Create all buttons for MainWindow

create_choice_boxes()
Create all choiceboxes for MainWindow

create_menus()
Create the menus

create_other_widgets()
Create all other widgets for MainWindow

create_text()
Create all text for MainWindow

define_vars()
Defines some variables used elsewhere in this class/instance

file_choice_handler(*_type*, *user_selection*, *default_dir*, *wildcard*, *style*)
Handle file dialogs for set_input_file, set_output_file, and set_map_file

focus_on_control_button(*event=None*)
Focus on the control button instead of the TextCtrl, and reset the insertion point back after 30 milliseconds, preventing the user from changing the insertion point and messing the formatting up.

get_diskinfo(*event=None*)
Call the thread to get Disk info, disable the update button, and start the throbber

make_status_bar()
Create and set up a statusbar

on_abort()
Abort the recovery

on_about(*event=None*)
Show the about box

on_control_button(*event=None*)
Handle events from the control button, as its purpose changes during and after recovery. Call self.on_abort() or self.on_start() as required.

on_detailed_info(*event=None*)
Show/Hide the detailed info, and rotate the arrow

on_exit(*event=None*, *just_finished_recovery=False*)
Exit DDRescue-GUI, if certain conditions are met

on_recovery_ended(*result*, *disk_capacity*, *recovered_data*, *return_code=None*)
Called to show MainWindow when a recovery is completed or aborted by the user

on_session_end(*event*)
Attempt to veto e.g. a shutdown/logout event if recovering data.

on_size(*event=None*)
Auto resize the list_ctrl columns

on_start()
Check the settings, prepare to start ddrescue and start the backend thread.

on_terminal_output(*event=None*)
Show/Hide the terminal output, and rotate the arrow

prompt_to_kill_ddrescue()
Prompts the user to try killing ddrescue again if it's not exiting

receive_diskinfo(*info*)
Get new Disk info and to call the function that updates the choiceboxes

restart()
Restart and reset MainWindow, so MainWindow is as it was when DDRescue-GUI was started

set_input_file(*event=None*)
Get the input file/Disk and set a variable to the selected value

set_map_file(*event=None*)
Get the map file position/name and set a variable to the selected value

set_output_file(*event=None*)
Get the output file/Disk and set a variable to the selected value

set_progress_bar_range(*message*)
Set the progressbar's range

set_vars()
Set some essential variables

setup_sizers()
Setup sizers for MainWindow

show_dev_info(*event=None*)
Show the Disk Information Window

show_privacy_policy(*event=None*)
Show PrivPolWindow

show_settings(*event=None*)
Show the settings Window, but only if input and output files have already been selected.

show_userguide(*event=None*)
Open a web browser and show the user guide

update_average_read_rate(*average_read_rate*)
Update the average read rate info

update_current_read_rate(*current_read_rate*)
Update the current read rate info

update_error_size(*error_size*)
Update the error size info

update_file_choices()
Update the Disk entries in the choiceboxes

update_input_pos(*input_pos*)
Update the input position info

update_num_errors(*num_errors*)
Update the num errors info

update_output_box(*line*)
Update the output box

update_output_pos(*output_pos*)
Update the output position info

update_progress(*recovered_data*, *disk_capacity*)
Update the progressbar and the title

update_recovered_data(*recovered_data*)
Update the recovered data info

update_status_bar(*messeage*)
Update the statusbar with a new message

update_time_elapsed(*line*)
Update the time elapsed text

update_time_remaining(*time_left*)
Update the time remaining text

update_time_since_last_read(*last_read*)
Update the time since last successful read info

class ddrescue_gui.DDRescue_GUI.**MyApp**(*redirect=False*, *filename=None*, *useBestVisual=False*, *clearSigInt=True*)
The wxPython app. Must be declared for application to work. This is how the application is started.

MacReopenApp()
Called when the doc icon is clicked, shows the top-level window again even if it's minimised. Makes the GUI work in a more intuitive way on macOS.

OnInit()
Used to show the splash screen, which then starts the rest of the application.

class ddrescue_gui.DDRescue_GUI.**PrivPolWindow**(*parent*)
DDRescue-GUI's privacy policy window.

bind_events()
Bind events so we can close this window.

create_widgets()
Create all widgets for PrivPolWindow

on_close(*event=None*)
Close PrivPolWindow

setup_sizers()
Set up sizers for PrivPolWindow

class ddrescue_gui.DDRescue_GUI.**SettingsWindow**(*parent*)
DDRescue-GUI's settings window

bind_events()
Bind all events for SettingsWindow

create_buttons()
Create all buttons for SettingsWindow

create_check_boxes()
Create all CheckBoxes for SettingsWindow, and set their default states (all unchecked)

create_choice_boxes()
Create all ChoiceBoxes for SettingsWindow, and call self.set_default_recovery_settings()

create_text()
Create all text for SettingsWindow

save_options(*event=None*)
Save all options, and exit SettingsWindow

set_best_recovery_settings(*event=None*)
Set selections for the Choiceboxes to best recovery settings

set_default_recovery_settings(*event=None*)
Set selections for the Choiceboxes to default settings

set_fast_recovery_settings(*event=None*)
Set selections for the Choiceboxes to fast recovery settings

set_soft_run(*event=None*)
Set up SettingsWindow based on the value of self.no_split_check_box (the "do soft run" CheckBox).

setup_options()
Set all options in the window so we remember them if the user checks back

setup_sizers()
Set up all sizers for SettingsWindow

class ddrescue_gui.DDRescue_GUI.**ShowSplash**(*parent=None*)
A simple class used to display the splash screen on startup. After that, it starts the rest of the application.

on_exit(*event=None*)
Close the splash screen and start MainWindow

ddrescue_gui.DDRescue_GUI.**usage**()
Outputs information on cmdline options for the user.

CHAPTER

TWO

DOCUMENTATION FOR THE PY2APP SETUP FILE (SETUP.PY)

This is a setup.py script written for DDRescue-GUI v2.0.0 by Hamish McIntyre-Bhatty.

Usage: python3 setup.py py2app

CHAPTER

THREE

DOCUMENTATION FOR THE UNIT TESTS RUNNER FILE (TESTS.PY)

This file is used to start the test suites for DDRescue-GUI.

ddrescue_gui.tests.**usage**()
    Outputs usage information

CHAPTER

FOUR

DOCUMENTATION FOR THE UNIT TESTS PACKAGE (TESTS)

This is the Tests package.

CHAPTER

FIVE

DOCUMENTATION FOR THE TOOLS PACKAGE (TOOLS)

This is the Tools package.

CHAPTER

SIX

DOCUMENTATION FOR THE BACKEND TOOLS MODULE IN THE TOOLS PACKAGE (TOOLS/TOOLS.PY)

This is the tools package for DDRescue-GUI.

class ddrescue_gui.Tools.tools.**AuthWindow**
A simple authentication dialog that is used when elevated privileges are required. Until version 2.0.0, this was used to start the GUI, but since that release, privileges are only escalated when required to improve security.

This is used to pre-authenticate on macOS if needed, before running a privileged task with sudo.

bind_events()
Bind all events for AuthenticationWindow

create_buttons()
Create all buttons for AuthenticationWindow

create_other_widgets()
Create all other widgets for AuthenticationWindow

create_text()
Create all text for AuthenticationWindow

on_auth_attempt(*event=None*)
Check the password is correct, then either warn the user or call self.start_ddrescuegui().

on_exit(*event=None*)
Close AuthWindow() and exit

run()
Preauthenticates macOS users with the auth dialog.

setup_sizers()
Setup sizers for AuthWindow

test_auth()
Check if we have cached authentication If so, return True. Otherwise return False.

ddrescue_gui.Tools.tools.**create_unique_key**(*dictionary*, *data*, *length*)
Create a unqiue dictionary key of length for dictionary dictionary for the item data. The unique key is created by adding a number on the the end of data, while keeping it at the correct length. The key will also start with '...'.

ddrescue_gui.Tools.tools.**determine_ddrescue_version**()
Used to determine the version of ddrescue installed on the system, or (for macOS) bundled with the GUI.

Handles -pre and -rc versions too, by stripping that information from the version string and warning the user.

ddrescue_gui.Tools.tools.**determine_output_file_type**(*SETTINGS*, *disk_info*)
Determines output File Type (partition or Device)

ddrescue_gui.Tools.tools.**emergency_exit**(*msg*)
Handle emergency exits. Warn the user, log, and exit to terminal with the given message

ddrescue_gui.Tools.tools.**get_helper**(*cmd*)
Figure out which helper script to use.

ddrescue_gui.Tools.tools.**get_mount_point**(*partition*)
Returns the mountpoint of the given partition, if any. Otherwise, return None

ddrescue_gui.Tools.tools.**is_mounted**(*partition*, *mount_point=None*)
Checks if the given partition is mounted. partition is the given partition to check. If mount_point is specified, check if the partition is mounted there, rather than just if it's mounted. Return boolean True/False.

ddrescue_gui.Tools.tools.**is_partition**(*disk*, *disk_info*)
Check if the given disk is a partition

ddrescue_gui.Tools.tools.**mac_get_device_name_mount_point**(*output*)
Get the device name and mount point of an output file, given output from hdiutil mount -plist

ddrescue_gui.Tools.tools.**mac_run_hdiutil**(*options*)
Runs hdiutil on behalf of the rest of the program when called. Tries to handle and fix hdiutil errors if they occur.

ddrescue_gui.Tools.tools.**mount_disk**(*partition*, *mount_point*, *options=''*)
Mounts the given partition. partition is the partition to mount. mount_point is where you want to mount the partition. options is non-mandatory and contains whatever options you want to pass to the mount command. The default value for options is an empty string.

ddrescue_gui.Tools.tools.**read**(*cmd*, *testing=False*)
Read the cmd's output char by char, but do as little processing as possible to improve startup performance

ddrescue_gui.Tools.tools.**send_notification**(*msg*)
Send a notification, created to reduce clutter in the rest of the code.

ddrescue_gui.Tools.tools.**start_process**(*cmd*, *return_output=False*, *privileged=False*)
Start a given process, and return output and return value if needed

ddrescue_gui.Tools.tools.**unmount_disk**(*disk*)
Unmount the given disk

CHAPTER

SEVEN

DOCUMENTATION FOR THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS)

These are the ddrescue tools.

CHAPTER

EIGHT

DOCUMENTATION FOR THE SETUP MODULE IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/SETUP.PY)

Used to set up the GUI to use the correct version of tools for the user's version of ddrescue.

ddrescue_gui.Tools.DDRescueTools.setup.**setup_for_ddrescue_version**(*ddrescue_version*)
Selects the correct tools for our version of ddrescue.

CHAPTER

NINE

DOCUMENTATION FOR THE DECORATORS MODULE IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/DECORATORS.PY)

Decorators for DDRescue tools

ddrescue_gui.Tools.DDRescueTools.decorators.**define_versions**(*function*)
Reads the function docstring to find the ddrescue versions the function supports.

CHAPTER

TEN

DOCUMENTATION FOR THE ALLVERSIONS MODULE IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/ALLVERSIONS.PY)

Tools for all versions of ddrescue.

ddrescue_gui.Tools.DDRescueTools.allversions.**get_initial_status**(*split_line*)

Function to get ddrescue's initial status. Works with ddrescue versions: 1.14,1.15,1.16,1.17,1.18,1.19,1.20,1.21,1.22,1.23

CHAPTER

ELEVEN

DOCUMENTATION FOR THE DDRESCUE TOOLS FOR DDRESCUE VERSION 1.14 IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/ONE_POINT_FORTEEN.PY)

Tools for ddrescue v1.14 or newer.

ddrescue_gui.Tools.DDRescueTools.one_point_forteen.**get_current_rate_error_size_recovered_da**
Get Current Read Rate, Error Size, and Recovered Data. Works with ddrescue versions: 1.14,1.15,1.16,1.17,1.18,1.19,1.20

ddrescue_gui.Tools.DDRescueTools.one_point_forteen.**get_inputpos_numerrors_averagereadrate**(*s*
Get Input Position, Number of Errors, and Average Read Rate. Works with ddrescue versions: 1.14,1.15,1.16,1.17,1.18,1.19,1.20

ddrescue_gui.Tools.DDRescueTools.one_point_forteen.**get_outputpos_time_since_last_read**(*split_l*
Get Output Position and Time Since Last Successful Read. Works with ddrescue versions: 1.14,1.15,1.16,1.17

CHAPTER

TWELVE

DOCUMENTATION FOR THE DDRESCUE TOOLS FOR DDRESCUE VERSION 1.18 IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/ONE_POINT_EIGHTEEN.PY)

Tools for ddrescue v1.18 or newer.

ddrescue_gui.Tools.DDRescueTools.one_point_eighteen.**get_outputpos_time_since_last_read**(*split_*

Get Output Position and Time Since Last Successful Read. Works with ddrescue versions: 1.18,1.19,1.20

CHAPTER

THIRTEEN

DOCUMENTATION FOR THE DDRESCUE TOOLS FOR DDRESCUE VERSION 1.20 IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/ONE_POINT_TWENTY.PY)

Tools for ddrescue v1.20 or newer.

ddrescue_gui.Tools.DDRescueTools.one_point_twenty.**get_time_since_last_read**(*split_line*)
Get Time Since Last Read. Works with ddrescue versions: 1.20,1.21,1.22,1.23

CHAPTER

FOURTEEN

DOCUMENTATION FOR THE DDRESCUE TOOLS FOR DDRESCUE VERSION 1.21 IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/ONE_POINT_TWENTY_ONE.PY)

Tools for ddrescue v1.21 or newer.

ddrescue_gui.Tools.DDRescueTools.one_point_twenty_one.**get_current_rate_inputpos**(*split_line*)
Get Current Read Rate and Input Position. Works with ddrescue versions: 1.21,1.22,1.23

ddrescue_gui.Tools.DDRescueTools.one_point_twenty_one.**get_outputpos_average_read_rate**(*split_l*
Get Output Position and Average Read Rate. Works with ddrescue versions: 1.21,1.22,1.23

ddrescue_gui.Tools.DDRescueTools.one_point_twenty_one.**get_recovered_data_num_errors**(*split_line*
Get Recovered Data and Number of Errors. Works with ddrescue versions: 1.21

ddrescue_gui.Tools.DDRescueTools.one_point_twenty_one.**get_unreadable_data**(*split_line*)
Get Unreadable Data. Works with ddrescue versions: 1.21,1.22,1.23

CHAPTER

FIFTEEN

DOCUMENTATION FOR THE DDRESCUE TOOLS FOR DDRESCUE VERSION 1.22 IN THE DDRESCUE TOOLS PACKAGE IN THE TOOLS PACKAGE (TOOLS/DDRESCUETOOLS/ONE_POINT_TWENTY_TWO.PY)

Tools for ddrescue v1.22 or newer.

ddrescue_gui.Tools.DDRescueTools.one_point_twenty_two.**get_recovered_data_num_errors**(*split_line*

Get Recovered Data and Number of Errors. Works with ddrescue versions: 1.22,1.23

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