DiWaCS Documentation
Release 0.9.3.1

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DiWaCS is an application developed for DiWa smart space and should be used **only** inside **Diwaamo**. DiWaCS connects to address **239.128.128.1:5555** using Pragmatic General Multicast (PGM). DiWaCS is built on Python and WxPython is used for UI programming. Currently, only supported platform is **Windows 7**.

Required python modules for DiWaCS:

- Configobj
- lxml
- PIL
- PyAudio
- Python Pubsub
- SQLAlchemy
- Watchdog
- WMI
- WxPython
- ZeroMQ with openpgm support

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AUTOMATED CODE DOCUMENTATION

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1.1 Add file module

Created on 5.6.2012

> **platform** Windows
>
> **synopsis** Used to add a file in the current project.
>
> **warning** Requires ZeroMQ.
>
> **author** neriksso

add_file.**main**()
    Main function of the sub program.

    Sub program is meant to be bound to windows explorer context menu. Context menu allows the user to quickly add files to project without interacting with DiWaCS directly.

    Transmits the add_file command to DiWaCS via interprocess socket.

> **Parameters filepath** (*String*) – Path of the file to be added.
>
> **Returns** windows success code (0 on success).
>
> **Return type** Integer

1.2 Send file module

Created on 5.6.2012

> **author** neriksso
>
> **requires** Requires ZeroMQ
>
> **synopsis** Used to send a file to another node.

send_file_to.**main**()
    Main function of the sub program.

    Sub program is meant to be bound to windows explorer context menu. Context menu allows the user to quickly send files without interacting with DiWaCS directly.

    Transmits the send_to command to DiWaCS via interprocess connection.

> **Parameters**
>
> - **node_id** (*Integer*) – ID of the node to send the file to.
>
> - **filepath** (*String*) – Path of the file to be sent.
>
> **Returns** windows success code (0 on success).
>
> **Return type** Integer

1.3 Controller package

Used to control the database.

1.3.1 controller.activity module

Created on 28.6.2013

> **author** neriksso

controller.activity.**add_or_update_activity**(*project_id*, *pgm_group*, *session_id=0*, *activity_id=0*)
> Add activity to database or update it if it exists already.
>
> **Parameters**
>
> - **project_id** (*Integer*) – ID of the project Activity is associated with.
>
> - **pgm_group** (*Integer*) – The PGM Group number.
>
> - **session_id** (*Integer*) – ID of the session Activity is associated with.
>
> - **activity_id** (*Integer*) – ID of the activity.
>
> **Returns** Activity ID of the added activity.
>
> **Return type** Integer

controller.activity.**get_active_activity**(*pgm_group*)
> Get the latest active activity.
>
> **Parameters** **pgm_group** (*Integer*) – The PGM Group number.
>
> **Returns** Latest active activity.
>
> **Return type** `models.Activity`

controller.activity.**unset_activity**(*pgm_group*)
> Unsets activity for PGM Group.
>
> **Parameters** **pgm_group** (*Integer*) – The PGM Group number.

1.3.2 controller.common module

Created on 28.6.2013

> **author** neriksso

controller.common.**delete_record**(*record_model*, *id_number*)
> Delete a record from database
>
> **Parameters**

- **record_model** (sqlalchemy.ext.declarative.declarative_base()) – The model for which to delete a record.

- **id_number** (*Integer*) – Recond id.

> **Returns** Success.

> **Return type** Boolean

controller.common.**get_or_create**(*model*, **filters*, ***initializers*)
> Fetches or creates a instance.

> > **Parameters model** (sqlalchemy.ext.declarative.declarative_base) – The model of which an instance is wanted.

> Filters are given after model and represent the query conditions for get.

> Initializers are given after filters and are keyword arguments used for initializing a new object.

> > **Returns** An object of the desired model.

> > **Throws** sqlalchemy.exc.SQLAlchemyException

controller.common.**set_node_name**(*name*)
> Set the stored node name for own swnp node as global.

> > **Warning** This should be removed in the future as globals are bad.

controller.common.**set_node_screens**(*screens*)
> Set the stored node screens settings for own swnp node as global.

> > **Warning** This should be removed in the future as globals are bad.

controller.common.**test_connection**()
> Test the connection to database.

> > **Returns** Does the software have access to the database at this time.

> > **Return type** Boolean

1.3.3 controller.computer module

Created on 28.6.2013

> **author** neriksso

controller.computer.**add_computer**(*name*, *pc_ip*, *wos_id*)
> Add a new computer to the database.

> > **Parameters**

> > - **name** (*String*) – Name of the computer.

> > - **pc_ip** (*String*) – IP address of the computer.

> > - **wos_id** (*Integer*) – Node ID of the computer (usually the last part of IP).

> > **Returns** The added computer

> > **Return type** models.Computer

controller.computer.**add_computer_to_session**(*session*, *name*, *pc_ip*, *wos_id*)
> Adds a computer to a session.

> > **Parameters**

> > - **session** (models.Session) – A current session.

- **name** (*String*) – A name of the computer.

- **pc_ip** (*Integer*) – Computers IP address.

- **wos_id** (*Integer*) – Wos id of the computer.

> **Note** This is not currently used so consider removing it.

controller.computer.**get_active_computers**(*timeout*, **filters*)
> Get all the active computers from database.

> > **Parameters timeout** (*Integer*) – The number of seconds an "active" computer may have been idle
> > while still being considered active. Default is 10 seconds.

> > **Returns** A list of active computers.

> > **Return type** List of `models.Computer`

controller.computer.**get_active_responsive_nodes**(*pgm_group*)
> Return the wos_id fields of all active responsive nodes.

> > **Parameters pgm_group** (*Integer*) – The responsive group we want.

> > **Returns** A list of node IDs that are both active and responsive.

> > **Return type** A list of Integer

controller.computer.**last_active_computer**()
> Is the current node last active computer.

> > **Return type** Boolean

controller.computer.**refresh_computer**(*computer*)
> Refresh the computer in database.

> > **Parameters computer** (`models.Computer`) – The computer to refresh.

controller.computer.**refresh_computer_by_wos_id**(*wos_id*, *new_name=None*, *new_screens=None*, *new_responsive=None*)
> Refresh the computer by node id and give it optionally new configurations.

> > **Parameters**

> > - **wos_id** (*Integer*) – The ID of the node to refresh.

> > - **new_name** (*String*) – Optional new name for the node.

> > - **new_screens** (*Integer*) – Optional new screens configuration for the node.

> > - **new_responsive** (*Integer*) – Optional new responsive setting for the node.

1.3.4 controller.handlers module

Created on 28.6.2013

> **author** neriksso

class controller.handlers.**PROJECT_EVENT_HANDLER**(*project_id*, *handler_type='project'*)
> Handler for FileSystem events on project folder. It uses watchdog library internally.

> > **Parameters project_id** (*Integer*) – Project id from database.

1.3.5 controller.project module

Created on 28.6.2013

> **author** neriksso

controller.project.**add_file_to_project**(*file_path*, *project_id*)
> Add a file to project. Copies it to the folder and adds a record to database.

> > **Parameters**

> > > - **file_path** (*String*) – A file_path.

> > > - **project_id** – Project id from database.

> > **Returns** New file_path.

> > **Return type** String

controller.project.**add_project**(*data*)
> Adds a project to database and returns a project instance

> > **Parameters data** (*A dictionary*) – Project information

> > **Return type** an instance of `models.Project`

controller.project.**check_password**(*project_id*, *password*)
> Check that the password is correct for accessing a given project.

> > **Note** This returns true also if the project does not have password specified as the project is public in that case. The password provided is ignored in this case.

> > **Parameters**

> > > - **project_id** (*Integer*) – ID of the project.

> > > - **password** (*String*) – Password to check.

> > **Returns** Is the password authorized to access the project.

> > **Type** Boolean

controller.project.**create_file_action**(*path*, *action_id*, *session_id*, *project_id*)
> Logs a file action to the database.

> > **Parameters**

> > > - **path** (*String*) – Filepath.

> > > - **action_id** (*Integer*) – File action id.

> > > - **session_id** (*Integer*) – Current session id.

> > > - **project_id** (*Integer*) – Project id from database.

controller.project.**edit_project**(*project_id*, *row*)
> Update the project info.

> > **Parameters**

> > > - **project_id** (*Integer*) – Database id number of the project.

> > > - **row** (*A dictionary*) – The new project information.

controller.project.**get_active_project**(*pgm_group*)
> Get the active project.

> > **Parameters pgm_group** (*Integer*) – The PGM Group number.

> **Returns** Active project ID.

> **Return type** Integer

`controller.project.`**`get_project_id_by_activity`**(*activity_id*)
   Get the project ID that this activity_id is a part of.

> **Parameters** **activity_id** (*Integer*) – ID of the activity_id.

> **Returns** The project ID.

> **Return type** Integer

`controller.project.`**`get_projects_by_company`**(*company_id*)
   Fetches projects by a company.

> **Parameters** **company_id** (*Integer*) – A company id from database.

`controller.project.`**`init_sync_project_directory`**(*project_id*)
   Initial sync of project dir and database.

> **Parameters** **project_id** (*Integer*) – Project id from database.

`controller.project.`**`is_project_file`**(*filename*, *project_id*)
   Checks, if a file belongs to a project. Checks both project folder and database.

> **Parameters**
>
>   • **filename** (*String*) – a filepath.
>
>   • **project_id** (*Integer*) – Project id from database.

> **Return type** Boolean

1.3.6 controller.session module

Created on 28.6.2013

> **author** neriksso

`controller.session.`**`add_event`**(*session_id*, *title*, *description*)
   Adds an event to the database. Returns the ID field of the added event.

> **Parameters**
>
>   • **session** (`models.Session`) – The current session.
>
>   • **description** (*String*) – Description of the event.

> **Returns** The event ID.

> **Return type** Integer

`controller.session.`**`end_session`**(*session_id*)
   Ends a session, sets its endtime to database. Ends file scanner.

> **Parameters** **session** (`models.Session`) – Current session.

`controller.session.`**`get_active_session`**(*pgm_group*)
   Get the active session.

> **Parameters** **pgm_group** (*Integer*) – The PGM Group number.

> **Returns** The active session ID.

> **Return type** Integer

controller.session.**get_latest_event_id**()
> Get the latest event id.
>
> > **Returns** The ID of latest event.
> >
> > **Return type** Integer

controller.session.**get_session_id_by_activity**(*activity_id*)
> Get the session ID that this activity_id is a part of.
>
> > **Parameters activity_id** (*Integer*) – ID of the activity_id.
> >
> > **Returns** The project ID.
> >
> > **Return type** Integer

controller.session.**start_new_session**(*project_id*, *old_session_id=None*)
> Creates a session to the database and return a session object.
>
> > **Parameters**
> >
> > - **project_id** (*Integer*) – Project id from database.
> >
> > - **old_session_id** (*Integer*) – A session id of a session which will be continued.

1.4 Dialogs module

Created on 4.6.2013

> **platform** Windows Vista, Windows 7, Windows 8
>
> **synopsis** Define the pop-up dialogs for the application.
>
> **note** Requires WxPython.
>
> **author** neriksso

class dialogs.**AddProjectDialog**(*parent*, *title*, *project_id=None*)
> A dialog for adding a new project
>
> > **Parameters**
> >
> > - **parent** (wx.Frame) – Parent frame.
> >
> > - **title** (*String*) – A title for the dialog.
>
> **OnAdd**(*event*)
> > Handles the addition of a project to database, when "Add" button is pressed.
> >
> > > **Parameters event** (*Event*) – GUI Event.
>
> **OnClose**(*event*)
> > Handles "Close" button presses.
> >
> > > **Parameters event** (*Event*) – GUI Event.
>
> **OnText**(*event*)
> > Event handler for text changed.

class dialogs.**ChooseDiwaProfileDialog**(*parent*, *profiles*)
> Allows user to select a DiWa profile from a list of profiles. Profiles are loaded from the filesystem.
>
> > **Parameters**
> >
> > - **parent** (*Object*) – The parent object.

- **profiles** (*List*) – List of profiles

Exit(*event*)
  Event handler for Exit button press.

  Parameters event (wx.Event) – GUI event.

static **ListDatabaseProfiles**()
  Returns the list of available profiles.

  Returns A list of profiles.

  Return type List of Strings

OnComboBox(*event*)
  Event handler for updating the state of OK button, depending if there's anything selected in the combo-box.

  Parameters event (wx.Event) – GUI event.

SelectDiwaProfile(*event*)
  Load settings from a profile, event handler.

  Parameters event (wx.Event) – GUI event.

exception dialogs.**CloseError**(**args*, ***kwds*)
  Class describing an error while closing application.

class dialogs.**ConnectionErrorDialog**(*parent*)
  Create a connection error dialog that informs the user about reconnection attempts made by the software.

  GetResult()
    Try to reconnect and return the outcome.

class dialogs.**DeleteProjectDialog**(*parent*, *title*, *project_id*)
  A dialog for deleting project.

  OnCancel(*event*)
    Event handler for pressing Cancel button.

  OnOk(*event*)
    Event handler for pressing OK button.

class dialogs.**ErrorDialog**(*parent*, *message*)
  Error dialog.

class dialogs.**PreferencesDialog**(*parent*, *config_object*)
  Creates and displays a preferences dialog that allows the user to change some settings.

  Parameters config_object (configobj.ConfigObj) – a Config object

  LoadPreferences()
    Load the current preferences and fills the text controls.

  OnCancel(*event*)
    Closes the dialog without modifications.

    Parameters event (*Event*) – GUI event.

  OpenConfig(*event*)
    Opens config file.

    Parameters event (*Event*) – GUI event.

  ReloadConfig(*event*)
    Opens config file.

> **Parameters event** (*Event*) – GUI event.

SavePreferences(*event*)
> Save the preferences.

> > **Parameters event** (*Event*) – GUI Event.

class dialogs.**ProjectAuthenticationDialog**(*parent*, *title*, *project_id*)
> A dialog for project authentication.

> **OnOk**(*event*)
> > Called on OK button press.

class dialogs.**ProjectSelectDialog**(*parent*)
> A dialog for selecting a project.

> > **Parameters parent** (wx.Frame) – Parent frame.

> **OnCancel**(*event*)
> > Handles "Cancel" button presses.

> > > **Parameters event** (*Event*) – GUI Event.

> **OnProjectAdd**(*event*)
> > Shows a modal dialog for adding a new project.

> > > **Parameters event** (*Event*) – GUI Event.

> **OnProjectDelete**(*event*)
> > Handles the selection of a project. Starts a wos.CURRENT_PROJECT, if necessary. Shows a dialog of the selected project.

> > > **Parameters evt** (*Event*) – GUI Event.

> **OnProjectEdit**(*event*)
> > Shows a modal dialog for adding a new project.

> > > **Parameters event** (*Event*) – GUI Event.

> **OnProjectSelect**(*event*)
> > Handles the selection of a project.

> > Starts a wos.CURRENT_PROJECT, if necessary. Shows a dialog of the selected project.

> > > **Parameters event** (*Event*) – GUI Event.

> **OnSelectionChange**(*event*)
> > Event handler for selection change of the listbox.

> **UpdateProjects**(*company_id=1*)
> > Fetches all projects from the database, based on the company.

> > > **Parameters company_id** (*Integer*) – A company id, the owner of the projects.

> > > **Returns** The total number of projects.

> > > **Type** Integer

class dialogs.**ProjectSelectedDialog**(*parent*, *project_id*)
> A dialog for project selection confirmation.

> **OnOk**(*event*)
> > Event handler for OK button press.

> > > **Parameters event** (wx.Event) – GUI event.

class `dialogs.`**`SendProgressBar`** (*parent*, *title*, *ypos*)
 Implements file send progress bar...

class `dialogs.`**`UpdateDialog`** (*title*, *url*, **args*, ***kwargs*)
 A Dialog which notifies about a software update. Contains the URL which the user can click on.

> **Parameters**
>> • **title** (*String*) – Title of the dialog.
>>
>> • **url** (*String*) – URL of the update.

 `OnOk` (*event*)
  Event handler for OK button press.

>> **Parameters event** (`wx.Event`) – GUI event.

 `UrlHandler` (*event*)
  Event handler for URL text press.

>> **Parameters event** (`wx.Event`) – GUI event.

`dialogs.`**`show_modal_and_destroy`** (*class_*, *parent*, *params=None*)
 Used to show modal and destroy afterwards.

Note: The implementation is kind of ugly, but guarantees a safe execution of the dialog without memory leaks and with all exceptions logged.

> **Parameters**
>> • **class** (*type*) – The type of dialog to show.
>>
>> • **parent** (`wx.Window`) – The parent wx.Window of this object.
>>
>> • **params** (*Dictionary.*) – The params to give for __init__ call.

> **Returns** The modal result value.

> **Return type** Integer

1.5 DiWaCS module

Created on 8.5.2012

> **author** neriksso

class `diwacs.`**`EventList`** (*parent*, **args*, ***kwargs*)
 A Frame which displays the possible event titles and handles the event creation.

 `CheckVisibility` (*selection*)
  Checks the visibility.

 `HideNow` ()
  Method to hide the event list.

 `OnEnter` (*event*)
  Event handler for pressing ENTER button.

>> **Parameters event** (`wx.Event`) – The EVT_ON_TEXT_EVENT event.

 `OnFocusLost` (*event*)
  On focus lost event handler.

OnSelection(*event*)
> On selection event handler.

OnText(*event*)
> On text event handler.

ShowNow()
> Method to show the event list.

class diwacs.**GraphicalUserInterface**
> WOS Application Frame.

> **DisableDirectoryButton**()
> > Used to disable the project directory button when project has been unselected.

> > ---
> > **Note:** There should be no need for this as the software should always start a new project after the old one ends. But for the mid state to be legitimate this is still usable.
> > ---

> **DisableSessionButton**()
> > Used to disable the needed buttons after session has been stopped.

> > ---
> > **Note:** Does not actually disable to session button, only the session state of the button.
> > ---

> **EnableDirectoryButton**()
> > Used to enable the project directory button when project has been selected.

> **EnableSessionButton**()
> > Used to enable the needed buttons after session has been started.

> **InitUICore**()
> > Inits the Core UI (guitemplates.GUItemplate.InitUI()) and binds the functionality.

> **OnAboutBox**(*event*)
> > About dialog.

> > > **Parameters event** (*Event*) – GraphicalUserInterface Event.

> **OnEventButton**(*event*)
> > Event Button handler.

> > > **Parameters event** (*Event*) – GraphicalUserInterface Event.

> **OnExit**(*event*)
> > Exits program.

> > > **Parameters event** (*Event*) – GraphicalUserInterface Event

> **OnFocus**(*event*)
> > Event handler for gained focus.

> > > **Parameters event** (wx.Event) – GUI event.

> **OnIconify**(*event*)
> > Window minimize event handler. Should toggle the minimized state of the application.

> > > **Parameters evt** (*Event*) – GraphicalUserInterface Event.

> **OnInfoBtn**(*event*)
> > Handles the pressing of Web-information button.

> > Directs the user to web-storage website/help.

OnMBBtn (*event*)
Handles the pressing of meetings browser button.

Directs the user to web-storage website/mb.

OnPreferences (*event*)
Preferences dialog event handler.

> **Parameters event** (*Event*) – GraphicalUserInterface Event.

OnProjectChanged ()
Project selected event handler.

OnSession (*event*)
Session button pressed.

The user either desires to start a new session or end an existing one.

> **Parameters event** (*Event*) – GraphicalUserInterface Event.

OnTaskBarActivate (*event*)
Taskbar activate event handler.

> **Parameters event** (*Event*) – GraphicalUserInterface Event.

OnTaskBarClose (*unused_event*)
Taskbar close event handler.

> **Parameters evt** (*Event*) – GraphicalUserInterface Event.

OnWABtn (*event*)
Handles the pressing of Web-application button.

Directs the user to web-storage website.

OpenProjectDir (*event*)
Opens project directory in windows explorer.

> **Parameters event** (*Event*) – The GraphicalUserInterface event.

SelectNode (*event*)
Handles the selection of a node, start remote control.

Note: For future use.

> **Parameters event** (*Event*) – GraphicalUserInterface Event

SelectProjectDialog (*event*)
Select project event handler.

> **Parameters event** (*Event*) – GraphicalUserInterface Event.

SetProjectName (*name*)
Set the project text. For example "No Project Selection".

Note: Requires None explicitly when the purpose is to set default label because writing SetProject-Name(None) is more informative than SetProjectName()

> **Parameters name** (*String*) – The name of the project to set as label.

Shift (*event*)
Caroussel Shift function.

> > **Parameters event** (*Event*) – GraphicalUserInterface Event.

> **UpdateScreens**(*update*)
> > Called when screens need to be updated and redrawn.

> > **Parameters update** (*Boolean*) – Pubsub needs one param, therefore it is called update.

diwacs.**main**(*profile*)
> Main function.

> > **Warning** The profiler has been pre-calibrated using the development machine so this should be changed for other development environments that wish to profile the execution of the diwacs system.

> > THIS ONLY WORKS WHEN diwavars.DEBUG HAS BEEN ENABLED.

> > Remember to disable it from release binaries.

> > **Parameters profile** (*Boolean*) – should the call be profiled?

1.6 DiWaVars module

DiWaCS Variables

> **author** neriksso

diwavars.**add_logger_initializer**(*logger_initializer*)
> For initializing the loggers from main.

> > **Parameters logger_initializer** (*function*) – The logger initializer to add to initialize chain.

diwavars.**add_logger_level_setter**(*logger_level_setter*)
> For setting application logger level globally.

> > **Parameters logger_level_setter** (*function*) – The logger level setter to add to level set chain.

diwavars.**print_to_status_box**(*line*)
> A function that get's called to print text into the status_box. This forwards the function call to the registered function (registered via register_status_box_callback()).

> > **Parameters value** (*String*) – The text to print to the status_box.

diwavars.**register_status_box_callback**(*state_func*, *print_func*)
> Register a function for changing the state of status_box and a function for printing data into the status_box.

> > **Parameters**

> > > • **state_func** (*Function(Integer)*) – A function that get's called with the new value of status_box when the value changes.

> > > • **print_func** (*Function(String)*) – A function that get's called to print text into the status_box.

diwavars.**set_blank_cursor**(*value*)
> Set the blank cursor variable.

diwavars.**set_config**(*config*)
> Set the CONFIG global...

diwavars.**set_default_cursor**(*value*)
> Set the default cursor variable.

diwavars.**set_run_cmd**(*value*)
> Update the RUN_CMD setting.

        Parameters **value** (*Boolean*) – Desired value.

diwavars.**set_running**()
> Set the currently running flag as true.
>
> Causes other modules to redirect their stdout and stderr streams to files.

diwavars.**set_using_diwa_profile**(*value*)
> Set variable defining is a profile in use.

diwavars.**update_audio**(*audio*)
> Update the global Audio variable.

diwavars.**update_camera_vars**(*url*, *user*, *passwd*)
> Update the global variables that control the camera settings.

diwavars.**update_config_loader**(*config_loader*)
> Set the CONFIG loader function...

diwavars.**update_database_vars**(*address=None*, *name=None*, *type_=None*, *user=None*, *password=None*)
> Update the global database settings.

diwavars.**update_keys**(*modifier=91*, *key=164*)
> Update the key combination to stop remote controlling.
>
> > **Parameters**
> >
> > - **modifier** (*Integer*) – The key to hold.
> >
> > - **key** (*Integer*) – The key to press while holding modifier key.

diwavars.**update_padfile**(*padurl*)
> Set the padfile address.

diwavars.**update_pgm_group**(*new_group*)
> Update the PGM group for this node.

diwavars.**update_responsive**(*responsive*)
> Update the global responsive setting.

diwavars.**update_status_box**(*value*)
> A function that get's called with the new value of status_box when the value changes. This forwards the function call to the registered function (registered via register_status_box_callback()).
>
> > **Parameters** **value** (*Integer*) – The new value of status box.

diwavars.**update_storage**(*storage*)
> Update the address of storage.
>
> > **Parameters** **storage** (*String*) – The new address of storage.

diwavars.**update_variable**(*name*, *value*)
> Set ANY global value in diwavars.py into **value** (literal_eval).
>
> EXAMPLE:

```
diwavars.update_variable('AUDIO', 'False')
```

> > **Parameters**
> >
> > - **name** (*String*) – The name of the global.
> >
> > - **value** (*String*) – The new value of the global embedded into a string.

diwavars.**update_windows_version**()

> **Updates the current version information to variables:**
>
> - WINDOWS_MAJOR
>
> - WINDOWS_MINOR

1.7 Filesystem module

Created on 17.5.2013

> **author** neriksso

filesystem.**copy_file_to_project**(*filepath*, *project_id*)
> Copy file to project dir and return new filepath in project directory.
>
> > **Parameters**
> >
> > - **filepath** (*String*) – The file path.
> >
> > - **project_id** (*Integer*) – Project id from database.
> >
> > **Returns** The path for this file in project directory or empty string.
> >
> > **Return type** String

filesystem.**copy_to_temporary_directory**(*filepath*)
> Copy a file to temporary folder.
>
> > **Parameters** **filepath** (*String*) – The file path.

filesystem.**create_project_directory**(*dir_name*)
> Creates a project directory, if one does not exist in the file system
>
> > **Parameters** **dir_name** (*String*) – Name of the directory

filesystem.**delete_directory**(*path*)
> Deletes a directory.
>
> > **Returns** Weather the function was successful or not.
> >
> > **Return type** String

filesystem.**get_current_wallpaper**(*win*)
> Try to get the current wallpaper image path.
>
> > **Parameters** **win** (*Tuple of Integers*) – Windows version (Major, Minor).
> >
> > **Returns** Wallpaper image path if it can find it.
> >
> > **Return type** String

filesystem.**get_file_extension**(*path*)
> Returns the file extension of a file
>
> > **Parameters** **path** (*String*) – The file path.
> >
> > **Return type** String

filesystem.**get_node_image**(*node*)
> Searches for a node's image in STORAGE.
>
> > **Parameters** **node** (*Integer*) – The node id.

`filesystem.`**`open_file`**(*filepath*)
> Opens a file path.
>
>> **Parameters** **filepath** (*String*) – The file path.

`filesystem.`**`save_screen`**(*filepath*)
> Saves the background image of the desktop.
>
>> **Parameters** **filepath** (*String*) – The filepath for the saved image.

`filesystem.`**`screen_capture`**(*path*, *node_id*)
> Take a screenshot and store it in project folder.
>
>> **Parameters**
>>
>> * **path** (*String*) – Path to the project folder.
>>
>> * **node_id** (*Integer*) – NodeID

`filesystem.`**`search_file`**(*filename*, *search_path*, *case_sensitive=True*)
> Search file in a given path.
>
>> **Parameters**
>>
>> * **filename** (*String*) – The file name.
>>
>> * **search_path** (*String*) – The search path.
>>
>> **Returns** The path to the file.
>>
>> **Return type** String

`filesystem.`**`test_storage_connection`**()
> Try to access \StorageProjects
>
>> **Returns** Does the path exist.
>>
>> **Return type** Boolean

1.8 Graphical Design module

Created on 6.6.2013

> **author** neriksso
>
> **synopsis** This file represents graphical designs of some GUI elements in DiWaCS.

class `graphicaldesign.`**`BlackOverlay`**(*pos*, *size*, *parent*, *text*)
> Represents all black frame without a mouse.

`OnFocusLost`(*evt*)
> Event handler for focus losing of the window.
>
>> **Parameters** **evt** (`wx.Event`) – The focus lost event.

`SetText`(*button_modifier=None*, *button=None*)
> Sets the text that appears on the black overlay.
>
>> **Parameters**
>>
>> * **button_modifier** (*String*) – The button name that should be held down.
>>
>> * **button** (*String*) – The button name that should be pressed when the modifier key is held down.

class graphicaldesign.**DropTarget**(*window*, *parent*, *i*)
    Implements drop target functionality to receive files, bitmaps and text.

> **OnData**(*x*, *y*, *d*)
>   Handles drag/dropping files/text or a bitmap.
>
> > **Parameters**
> >
> > - **x** (*Integer*) – The x coordinate of the drop-location.
> > - **y** (*Integer*) – The y coordinate of the drop-location.
> > - **d** – The data of drop.

class graphicaldesign.**EventListTemplate**(*parent*, **args*, ***kwargs*)
    Represents an event list menu.

> **GetProgramIcon**(*icon*)
>   Fetches gui icons.
>
> > **Parameters** **icon** (*String*) – The icon file name.
> >
> > **Return type** wx.Image

class graphicaldesign.**GUItemplate**(**args*, ***kwargs*)
    Represents the main GUI window graphical template.

> **Parameters**
>
> - **parent** (wx.Window) – Parent frame.
> - **id** (*Integer*) – ID of the new Frame.
> - **title** (*String*) – Title for the frame, default = EmptyString.
> - **pos** (*wx.Point*) – Position of the new frame.
> - **size** (*wx.Size*) – Size of the new frame.
> - **style** (*long*) – Style flags for the new frame.
> - **name** (*String*) – Name of the new frame.

> **AlignCenterTop**()
>   Aligns frame to Horizontal center and vertical top.

> **ConnectionErrorHandler**(*error*)
>   Show connection error handler dialog.

> **GetProgramIcon**(*icon*)
>   Fetches a GUI icon.
>
> > **Parameters** **icon** (*String*) – The icon file name.
> >
> > **Return type** wx.Image

> **HideScreens**()
>   Hides all screens.

> **InitScreens**()
>   Inits Screens.

> **InitUI**(*node_id*)
>   UI initializing.
>
> > **Parameters** **node_id** (*Integer*) – The id of current swnp node (self).

> **OnExit**(*event*)
>> Exits program.
>>
>>> **Parameters event** (*Event*) – GUI Event
>
> **SelectNode**(*evt*)
>> Handles the selection of a node, prototype.
>>
>>> **Parameters evt** (*Event*) – GUI Event

class graphicaldesign.**MySplashScreen**(*parent=None*)
> Create a splash screen widget.

class graphicaldesign.**NodeScreen**(*node*, *parent*)
> Represents a bitmap with node id.
>
> **EmptyScreen**()
>> Make this screen EmptyScreen.
>
> **ReloadAs**(*node*)
>> Reload the content of this bitmap.
>
> **SetNodeVars**()
>> Sets NodeScreens variables.
>
> **static update_bitmaps**()
>> Load the static bitmaps for hidden and wallpaperless screens. This caches them in memory to be used later without IO calls.

class graphicaldesign.**SysTray**(*parent*)
> Taskbar Icon class.
>
>> **Parameters parent** (wx.Frame) – Parent frame
>
> **CreateMenu**()
>> Create systray menu.
>
> **ShowMenu**(*event*)
>> Show popup menu.
>>
>>> **Parameters event** (*Event*) – GUI event.
>
> **ShowNotification**(*title*, *message*)
>> Start a thread to show the notification.
>>
>>> **Parameters**
>>>
>>> • **title** (*Unicode*) – Title to diplay in the balloon.
>>>
>>> • **message** (*Unicode*) – Message to display in the balloong (max 255 chars).

1.9 Macro module

> **author** neriksso
>
> **synopsis** macro.py defines a few user input functions.

macro.**GetKeydown**(*code*)
> Check if the key with keycode is held down.
>
>> **Parameters code** (*Integer*) – Keycode of the key.

class macro.**HardwareInput**
> Docstring here.

class macro.**Input**
> Docstring here.

class macro.**Input_I**
> Docstring here.

class macro.**KeyBdInput**
> Docstring here.

class macro.**MacroPoint**
> Stores the x and y components of coordinates.
>
> > **Attribute x** c_ulong
> >
> > **Attribute y** c_ulong

class macro.**MouseInput**
> Docstring here.

macro.**click**()
> Send a mouse click_type: LeftButton down, LeftButton up.

macro.**get_mouse_position**()
> Return the current position of the mouse.
>
> > **Returns** The position of the mouse.
> >
> > **Return type** [MacroPoint](#)

macro.**get_sendkeys**(*code*)
> Returns a character for a key code.
>
> > **Parameters** code (*Integer*) – The character code.

macro.**hold**()
> Send a mouse hold: LeftButton down.

macro.**key_press**(*event*, *kcode*)
> Used to send a single virtual keycode to the system.
>
> > **Parameters**
> >
> > - **event** (wx.Event) – Captured key event.
> > - **kcode** (*Integer*) – Keycode.

macro.**middle_click**()
> Send a mouse middle click_type: MiddleButton down, MiddleButton up.

macro.**middle_hold**()
> Send a mouse middle click_type: MiddleButton down.

macro.**middle_release**()
> Send a mouse middle click_type: MiddleButton up.

macro.**move**(*pos_x*, *pos_y*)
> move the cursor for pos_x amount in horizontal direction and pos_y amount in vertical direction.
>
> > **Parameters**
> >
> > - **pos_x** (*Integer*) – Amount to move in horizontal direction.
> > - **pos_y** (*Integer*) – Amount to move in vertical direction.

macro.**move_to**(*pos_x*, *pos_y*)
  move the mouse cursor to point (pos_x, pos_y) on screen.

> **Parameters**
>
> - **pos_x** (*Integer*) – X coordinate of the desired position.
> - **pos_y** (*Integer*) – Y coordinate of the desired position.

macro.**release**()
  Send a mouse release_type: LeftButton up.

macro.**release_all_keys**()
  Reset every keycode state to UP state.

macro.**right_click**()
  Send a mouse right click_type: RightButton down, RightButton up.

macro.**right_hold**()
  Send a mouse right hold: RightButton down.

macro.**right_release**()
  Send a mouse right release_type: RightButton up.

macro.**send_input**(*intype*, *data*, *flags*, *scan=0*, *mouse_data=0*)
  send_input sends virtual user input.

> **Parameters**
>
> - **intype** (*String*) – Input type, either 'mouse_input' for mouse input or 'key_input' for keyboard input.
> - **data** (*Integer or (Integer, Integer)*) – Input data, keycode to input or a tuple of (x, y) for mouse.
> - **flags** (*Integer*) – Input flags, used to separate keyup and keydown events.
> - **scan** (*Integer*) – Input scancode. More info in: http://en.wikipedia.org/wiki/Scancode
> - **mouse_data** (*Integer*) – Represents additional information about mouse events for example wheel amount.

macro.**slide**(*difference_x*, *difference_y*)
  slide the mouse for difference_x amount in horizontal direction and difference_y amount in vertical direction.

> **Parameters**
>
> - **difference_x** (*Integer*) – The amount to slide in horizontal direction.
> - **difference_y** (*Integer*) – The amount to slide in vertical direction.

macro.**slide_to**(*target_x*, *target_y*, *speed='normal'*)
  Slides the mouse to point (target_x, target_y)

> **Parameters**
>
> - **target_x** (*Integer*) – The target X coordinate.
> - **target_y** (*Integer*) – The target Y coordinate.
> - **speed** (*String*) – The speed of motion 'slow', 'normal' or 'fast'.

1.10 Modelsbase module

Created on 31.6.2013

> **author** neriksso
>
> **note** Requires `sqlalchemy`
>
> **synopsis** Defines and constructs the SQL alchemy Base class.

exception `modelsbase.`**`ItemAlreadyExistsException`**(*message*)
> When the item already exists in the database, you need to use get method instead of constructor.

class `modelsbase.`**`MethodMixin`**
> A base class for all our DiWa models.
>
> Defines some common methods / use cases of SQLAlchemy.
>
> **`delete`**()
> > Delete an object of this class from the database.
>
> **classmethod** **`delete_many`**(*instances*)
> > Delete objects of this class from the database.
>
> **classmethod** **`get`**(*method*, **filters*)
>
> > **Parameters** **method** (*String*) –
> >
> > **Valid values are:**
> >
> > - all - This returns a list of matching objects.
> > - count - This returns an integer which represents the count of matching objects.
> > - delete - This deletes all the matching objects from the database.
> > - exists - This returns boolean informing weather the an object match was found from the database.
> > - first - This returns the first matching object.
> > - last - This returns the last matching object.
> > - one - This returns the object if it exists and raises an exception if it doesn't or if there's more than one instance of the desired object.
> >
> > Additional parameters may be specified to filter results.
>
> **classmethod** **`get_by_id`**(*id_=1*)
> > Gets the instance of model by ID.
> >
> > > **Parameters** **id** (*Integer*) – ID of the desired model.
>
> **classmethod** **`id_ordering`**(*instance*)
> > Key function for id ordering.
>
> **`update`**()
> > Posts updates to this object into the database.
> >
> > > **Returns** Success value.
> > >
> > > **Return type** Boolean
>
> **classmethod** **`update_many`**(*instances*)
> > Posts updates to these objects into the database.
> >
> > > **Returns** Success value.

> > **Return type** Boolean

`modelsbase.`**`connect_to_database`**(*expire=False*)
> Connect to the database and return a Session object.

> > **Parameters expire** (*Boolean*) – Parameter passed to session maker as expire_on_commit.

> > **Returns** Session.

> > **Return type** `sqlalchemy.orm.session.Session`

`modelsbase.`**`create_all`**()
> Create tables to the database.

`modelsbase.`**`update_database`**()
> Update the database connection engine.

> ---
> **Note:** This only works when DB_STRING is completely defined by the log reader as otherwise the create_engine call would cause an exception.
> ---

1.11 Models module

Created on 23.5.2012

> **author** neriksso

> **note** Requires `sqlalchemy`

> **synopsis** Defines and constructs the SQL alchemy Base class.

class `models.`**`Action`**(*name*)
> A class representation of a action. A file action uses this to describe the action.

> **Field:**

> > - id (`sqlalchemy.schema.Column(Integer)`) - ID of the action, used as primary key in database table.

> > - name (`sqlalchemy.schema.Column(String)`) - Name of the action (Max 50 characters).

> > **Parameters name** (`String`) – Name of the action.

class `models.`**`Activity`**(*project*, *session=None*)
> A class representation of an activity.

> **Fields:**

> > - id (`sqlalchemy.schema.Column(Integer)`) - ID of activity, used as primary key in database table.

> > - session_id (`sqlalchemy.schema.Column(Integer)`) - ID of the session activity belongs to.

> > - session (`sqlalchemy.orm.relationship`) - Session relationship.

> > - project_id (`sqlalchemy.schema.Column(Integer)`) - ID of the project activity belongs to.

> > - project (`sqlalchemy.orm.relationship`) - Project relationship.

> > - active (`sqlalchemy.schema.Column(Boolean)`) - Boolean flag indicating that the project is active.

> Parameters
>
> - **project** (`models.Project`) – Project activity belongs to.
>
> - **session** (`models.Session`) – Optional session activity belongs to.

class `models.Company`(*name*)

> A class representation of a company.
>
> **Fields:**
>
> - `id` (`sqlalchemy.schema.Column(Integer)`) - ID of the company, used as primary key in database table.
>
> - `name` (`sqlalchemy.schema.Column(String)`) - Name of the company (Max 50 characters).
>
> Parameters **name** (`String`) – The name of the company.

class `models.Computer`(*name*, *ip*, *mac*, *screens*, *responsive*, *pgm_group*, *wos_id*)

> A class representation of a computer.
>
> **Fields:**
>
> - `id` (`sqlalchemy.schema.Column(Integer)`) - ID of computer, used as primary key in database table.
>
> - `name` (`sqlalchemy.schema.Column(String)`) - Name of the computer.
>
> - `ip` (`sqlalchemy.schema.Column(Integer)`) - Internet Protocol address of the computer (Defined as unsigned).
>
> - `mac` (`sqlalchemy.schema.Column(String)` - Media Access Control address of the computer.
>
> - `time` (`sqlalchemy.schema.Column(DateTime)`) - Time of the last network activity from the computer.
>
> - `screens` (`sqlalchemy.schema.Column(SmallInteger)`) - Number of screens on the computer.
>
> - `responsive` (`sqlalchemy.schema.Column(SmallInteger)`) - The responsive value of the computer.
>
> - `user_id` (`sqlalchemy.schema.Column(Integer)`) - ID of the user currently using the computer.
>
> - `user` (`sqlalchemy.orm.relationship`) - The current user.
>
> - `wos_id` (`sqlalchemy.schema.Column(Integer)`) - Network node ID, usually the last part of IP address (X.X.X.Y).
>
> **classmethod** `get_most_recent_by_mac`(*mac_address*)
>
> > Retrieve a computer by it's hardware identifier.
>
> **classmethod** `time_ordering`(*computer*)
>
> > Key function for time ordering.

class `models.Event`(*session_id*, *title=''*, *description=''*)

> A class representation of Event. A simple note with timestamp during a session.
>
> **Fields:**
>
> - `id` (`sqlalchemy.schema.Column(Integer)`) - ID of the event, used as primary key in database table.

- `title` `(sqlalchemy.schema.Column(String))` - Title of the event (Max 40 characters).
- `desc` `(sqlalchemy.schema.Column(String))` - More in-depth description of the event (Max 500 characters).
- `time` `(sqlalchemy.schema.Column(DateTime))` - Time the event took place.
- `session_id` `(sqlalchemy.schema.Column(Integer))` - ID of the session this event belongs to.
- `session` `(sqlalchemy.orm.relationship)` - Session this event belongs to.

class `models.`**`File`**(*path*, *project_id=None*)

A class representation of a file.

Fields:

- `id(sqlalchemy.schema.Column(Integer))` - ID of the file, used as primary key in database table.
- `path(sqlalchemy.schema.Column(String))` - Path of the file on DiWa (max 255 chars).
- `project_id(sqlalchemy.schema.Column(Integer))` - ID of the project this file belongs to.
- `project(sqlalchemy.orm.relationship)` - Project this file belongs to.

class `models.`**`FileAction`**(*file_*, *action*, *session=None*, *computer=None*, *user=None*)

A class representation of a file action.

Fields:

- `id(sqlalchemy.schema.Column(Integer))` - ID of the FileAction, used as primary key in the database table.
- `file_id (sqlalchemy.schema.Column(sqlaclhemy.types.Integer))` - ID of the file this FileAction affects.
- `file(sqlalchemy.orm.relationship))` - The file this FileAction affects.
- `action_id(sqlalchemy.schema.Column(Integer))` - ID of the action affecting the file.
- `action(sqlalchemy.orm.relationship))` - Action affecting the file.
- `action_time(sqlalchemy.schema.Column(DateTime))` - Time the action took place on.
- `user_id(sqlalchemy.schema.Column(Integer))` - ID of the user performing the action.
- `user(sqlalchemy.orm.relationship)` - User peforming the action.
- `computer_id(sqlalchemy.schema.Column(Integer))` - ID of the computer user performed the action on.
- `computer(sqlalchemy.orm.relationship)` - Computer user performed the action on.
- `session_id(sqlalchemy.schema.Column(Integer))` - ID of the session user performed the action in.
- `session(sqlalchemy.orm.relationship)` - Session user performed the action in.

Parameters

- **file** (`models.File`) – The file which is subjected to the action.
- **action** (`models.Action`) – The action which is applied to the file.
- **session** (`models.Session`) – The session in which the FileAction took place on.

- **computer** (`models.Computer`) – The computer from which the user performed the action.

- **user** (`models.User`) – The user performing the action.

class `models.`**`Project`** (*name*, *directory*, *company*, *password*)

A class representation of a project.

Fields:

- `id (sqlalchemy.schema.Column(Integer))` - ID of project, used as primary key in database table.

- `name (sqlalchemy.schema.Column(String))` - Name of the project (Max 50 characters).

- `company_id (sqlalchemy.schema.Column(Integer))` - ID of the company that owns the project.

- `company (sqlalchemy.orm.relationship)` - The company that owns the project.

- `dir (sqlalchemy.schema.Column(String))` - Directory path for the project files (Max 255 characters).

- `password (sqlalchemy.schema.Column(String))` - Password for the project (Max 40 characters).

- `members (sqlalchemy.orm.relationship)` - The users that work on the project.

Parameters

- **name** (`String`) – Name of the project.

- **directory** (`String`) – The location of project on disc.

- **company** (`models.Company`) – The owner of the project.

- **password** (`String`) – The project password.

class `models.`**`Session`** (*project*, *previous_session=None*)

A class representation of a session.

Fields:

- `id (sqlalchemy.schema.Column(Integer))` - ID of session, used as primary key in database table.

- `name (sqlalchemy.schema.Column(String))` - Name of session (Max 50 characters).

- `project_id (sqlalchemy.schema.Column(Integer))` - ID of the project the session belongs to.

- `project (sqlalchemy.orm.relationship)` - The project the session belongs to.

- `starttime (sqlalchemy.schema.Column(DateTime))` - Time the session began, defaults to *now()*.

- `endtime (sqlalchemy.schema.Column(DateTime))` - The time session ended.

- `previous_session_id (sqlalchemy.schema.Column(Integer))` - ID of the previous session.

- `previous_session (sqlalchemy.orm.relationship)` - The previous session.

- `participants (sqlalchemy.orm.relationship)` - Users that belong to this session.

- `computers (sqlalchemy.orm.relationship)` - Computers that belong to this session.

> **Parameters project** (`models.Project`) – The project for the session.

AddUser(*user*)
> Add users to a session.
>
> > **Parameters user** (`models.User`) – User to be added into the session.

GetLastChecked()
> Fetch `last_checked` field.
>
> > **Returns** `last_checked` field (None before `models.Session.start()` is called).
> >
> > **Return type** `datetime.datetime` or `None`

Start()
> Start a session. Set the `last_checked` field to current DateTime.

class `models.`**User**(*name*, *company*, *email=None*, *title=None*, *department=None*)
> A class representation of a user.
>
> > **Note** Currently not used anywhere.

Fields:

- id (`sqlalchemy.schema.Column(Integer)`) - ID of the user, used as primary key in database table.
- name (`sqlalchemy.schema.Column(String)`) - Name of the user (Max 50 characters).
- email (`sqlalchemy.schema.Column(String)`) - Email address of the user (Max 100 characters).
- title (`sqlalchemy.schema.Column(String)`) - Title of the user in the company (Max 50 characters).
- department (`sqlalchemy.schema.Column(String)`) - Department of the user in the company (Max 100 characters).
- company_id (`sqlalchemy.schema.Column(Integer)`) - Company id of the employing company.
- company (`sqlalchemy.orm.relationship`) - Company relationship.

> **Parameters**
>
> - **name** (`String`) – Name of the user.
> - **company** (`models.Company`) – The employer.

1.12 Setup module

Created on 8.5.2012

> **author** nick26

> **synopsis** This file is used to compile a DiWaCS.exe file out of the python project using py2exe and setuptools packages available at: pypi.python.org/pypi/setuptools

1.13 Models state

Created on 4.7.2013

> **author** neriksso

exception state.**SessionChangeException**
> A stub for new Exception that just had a different type to be catchable in its own right.

class state.**State**(*parent*)
> Used to represent the state of the client.
>
> All the graphical buttons etc have been removed from here and they are part of the main GraphicalUserInterface class right now. Likewise that class should minimize making direct changes to the current status of the software and only interpret user input.
>
> **append_swnp_data**(*new_data*)
> > Append data to current data value for `swnp.Node`
> >
> > > **Parameters new_data** (*String*) – Value to be added
>
> **destroy**()
> > Part of the shutdown routine, closes all the threads under this.
>
> **end_current_project**()
> > End the current project.
>
> **end_current_session**()
> > End the current session.
>
> **get_random_responsive**()
> > Get a random node amongst all the responsive nodes.
>
> **get_swnp_data**()
> > Returns the data value for `swnp.Node`
>
> **handle_file_send**(*filenames*, *dialog_parameters=None*)
> > Sends a file link to another node.
> >
> > First parses all the files and folder structure, then confirms weather the users wishes to add the items to project before beginning the copy routine.
> >
> > The copy routine first creates all the needed sub-folders and then sums up all the file sizes to be copied. Then it will update the dialog in the beginning/end of every file transaction and whenever there's been more than 1 second from the last update dialog update. Assuming the dialog_parameters parameter has been given.
> >
> > **The progress dialog, if supplied, is updated as follows:**
> >
> > - If there's less than DEF_FILES (**40**) files the dialog will not be shown or updated.
> > - If the data size sum is less than DEF_SIZE (**2 MB**) the dialog will not be shown or updated.
> > - Title will contain the total percentage of data transfer.
> > - Message will contain the percentage of current file transfer.
> > - Progress bar is set to percent [0, 100] of the total data transfer.
> >
> > **Parameters**
> >
> > - **filenames** (*List of String*) – All the files/folders to be copied.

- **dialog_parameters** (`dict`) – The progress dialog to create by show_modal_and_destroy, initialization parameters in a dictionary.

initialize()
    Finish the initialization (2-stage init).

> **Note** As this is not so essential, we could just stick it up to the __init__ but there might be something that needs to be done in between the __init__ and these calls here.

message_handler(*message*)
    Message handler for received messages.

> **Parameters message** (*String*) – Received message.

on_project_selected()
    Event handler for project selection in the client.

on_session_changed(*desired_state*)
    Event handler for session change in the client.

remove_from_swnp_data(*old_data*)
    Removes data value from current data value for `swnp.Node`

> **Parameters old_data** (*String*) – Old data value

remove_observer()
    Docstring.

send_pop_clipboard(*target_node_id*)
    Sends a command to another node that they should restore their old clipboard content and send the overwritten content back to this node.

> **Parameters target_node_id** (*Integer*) – The ID of the node that should perform the operation.

send_push_clipboard(*target_node_id*)
    Sends a command to another node that they should save their clipboard content and set the current content to what this node has on its clipboard at this moment.

> **Parameters target_node_id** (*Integer*) – The ID of the node that should perform the operation.

set_current_project(*project_id*)
    Start current project loop.

> **Parameters project_id** (*Integer*) – The project id from database.

set_current_session(*session_id*)
    Set current session.

> **Parameters session_id** (*Integer*) – a session id from database.

set_observer()
    Set an observer for file changes in project directory and and observer for image uploads by camera in scan folder.

set_responsive()
    Set the current node as responsive.

set_swnp_data(*data*)
    Set data value for `swnp.Node`

> **Parameters data** (*String*) – New data value

start_audio_recorder()
    Starts the audio recorder thread.

start_current_project_thread()
> Start current project loop.

start_current_session_thread()
> Start current project loop.

start_new_session()
> Start a new session.

stop_responsive()
> Stop being responsive.

swnp_send(*node*, *message*)
> Sends a message to the node.

>> **Parameters**
>>
>> - **node** (*String*) – The node for which to send a message.
>>
>> - **message** (*String*) – The message.

state.**create_config**()
> Creates a config file.

> This actually just copies the default one from installation folder to the ~wos settings folder.

state.**initialization_test**()
> Used to test that we have are good to go.

> At this time only includes test_connection() from controller, but more tests could be added here.

state.**load_config**()
> Loads a config file, creating it if it does not exists.

1.14 SWNP module

Created on 30.4.2012

> **author** neriksso

class swnp.**Message**(*tag*, *prefix*, *payload*)
> A class representation of a Message.

> Messages are divided into three parts: tag, prefix, payload. Messages are encoded to json for transmission.

>> **Parameters**
>>
>> - **tag** (*String*) – tag of the message.
>>
>> - **prefix** (*String*) – prefix of the message.
>>
>> - **payload** (*String*) – payload of the message.

> static **from_json**(*json_dict*)
>> Return a message from json.

>>> **Parameters** **json_dict** (*json*) – The json.

>>> **Returns** Initializes a message from JSON object.

>>> **Return type** swnp.Message.

> static **to_dict**(*msg*)
>> Return a message in a dict.

> **Parameters msg** (`swnp.Message`) – The message.
>
> **Returns** Dictionary representation of the message.
>
> **Return type** Dict

class `swnp.`**`Node`** (*node_id*, *screens*, *name=None*, *data=None*)
    A class representation of a node in the network.

> **Parameters**
>
> - **node_id** (*Integer*) – Node id.
>
> - **screens** (*Integer*) – Amount of visible screens.
>
> - **name** (*String*) – The name of the node.

`data`
    Returns data.

`get_age` ()
    Return the elapsed time since last refresh.

`refresh` ()
    Updates the timestamp.

class `swnp.`**`SWNP`** (*pgm_group*, *screens=0*, *name=None*, *context=None*, *error_handler=None*)
    The main class of swnp.

    This class has the required ZeroMQ bindings and is responsible for communicating with other instances.

> **Warning:** Only one instance per computer

> **Parameters**
>
> - **pgm_group** (*Integer*) – The Multicast Group this node wants to be a part of.
>
> - **screens** (*Integer*) – The number of visible screens. Defaults to 0.
>
> - **name** (*String*) – The name of the instance.
>
> - **context** (`zmq.Context`) – ZeroMQ context to use.
>
> - **error_handler** (`wos.CONN_ERR_TH`) – Error handler for the init constructor.

`close` ()
    Closes all connections and exits.

`do_ping` ()
    Send a PING message to the network.

`find_node` (*node_id*)
    Search the node list for a specific node.

> **Parameters node_id** (*Integer*) – The id of the searched node.
>
> **Return type** `swnp.Node`

`get_list` ()
    Returns a list of all nodes

> **Return type** list

`get_screen_list` ()
    Returns a list of screens nodes.

> **Return type** list.

---

ping_handler(*payload*)
    A handler for PING messages. Sends update_screens, if necessary.

    Parameters payload (*String*) – The payload of a PING message.

ping_routine(*error_handler*)
    A routine for sending PING messages at regular intervals.

send(*tag*, *prefix*, *message*)
    Send a message to the network.

    Parameters

    • **tag** (*String*) – The tag of the message; recipient.

    • **prefix** (*String*) – The prefix of the message.

    • **message** (*String*) – The payload of the message.

set_name(*name*)
    Sets the name for the instance.

    Parameters name (*String*) – New name of the instance.

set_responsive(*responsive*)
    Sets the responsive flag for the instance.

    Parameters responsive (*Integer*) – New number of screens.

set_screens(*screens*)
    Sets the number of screens for the instance.

    Parameters screens (*Integer*) – New number of screens.

shutdown()
    Shuts down all connections, no exit.

static **start_sub_routine**(*target*, *routine*, *name*, *args*)
    A wrapper for starting up subroutine threads.

    Parameters

    • **target** (`threading.Thread`) – Variable that contains the current thread for routine.

    • **routine** – The routine to run.

    • **name** (*String*) – Name of the routine.

    • **args** (*List*) – Arguments for the routine.

    Returns The thread of subroutine.

    Return type `threading.Thread`

sub_routine(*sub_urls*)
    Subscriber routine for the node ID.

    Parameters sub_urls (*List of Strings*) – Subscribing URLs.

sub_routine_sys(*sub_urls*)
    Subscriber routine for the node ID.

    Parameters sub_urls (*List of Strings*) – Subscribing URLs.

sys_handler(*msg*)
    Handler for "SYS" messages.

    Parameters msg (`swnp.Message`) – The received message.

---

timeout_routine()
> Routine for checking node list and removing nodes with timeout.

update_pgm_group(*new_pgm_group*)
> This updates the PGM group on the fly.

> > **Parameters**

> > > • **new_pgm_group** – New PGM Group value.

> > > • **new_pgm_group** – Integer

1.15 Testing module

Created on 20.5.2013

> **author** Kristian

class testing.**CallAbsorber**
> Substitute for GUIs.

class testing.**TestAudioRecorder**(*methodName='runTest'*)
> Test audio recorder module.

> **setUp**()
> > Set up the audio recorder helpers for testing.

> **tearDown**()
> > Stub to add cleaners in.

> **test_record**()
> > Test recording functionality of AudioRecorder.

class testing.**TestDiwa**
> Container for unittest cases.

> **run**(*result*, *debug=False*)
> > Run the unittest.

class testing.**TestDocumentation**(*methodName='runTest'*)
> Test that every Python function has been documented.

> **setUp**()
> > Stub to add helpers in.

> **tearDown**()
> > Stub to add cleaners in.

> **test_documentation**()
> > Test that most of the code has been documented.

> > **Note** The algorithm that calculates the documentation percentage is not perfect but kind of works. It could be improved by using actual parser (and pylint even does the same) but this makes it an actual testcase.

> > This also prints out the missed lines where there should have been documentation (docstrings) and prints the total percentage of the project documented.

> > This test fails if the percentage is lower than a hard-coded expected value. That value defaults to 95% at this moment.

class testing.**TestFilesystem**(*methodName='runTest'*)
> Test filesystem module.

> **setUp**()
> > Stub to add helpers in.

> **tearDown**()
> > Stub to add cleaners in.

> **test_searchfile**()
> > Test searchfile function.

class testing.**TestUtils**(*methodName='runTest'*)
> Test utils module.

> **setUp**()
> > Stub to add helpers in.

> **tearDown**()
> > Stub to add cleaners in.

> **test_iterislast**()
> > Test IterIsLast function.

1.16 Threads package

Set of threading functionality.

1.16.1 threads.audiorecorder module

Created on 5.6.2013

> **author** neriksso

class threads.audiorecorder.**AudioRecorder**(*parent*)
> A thread for capturing audio continuously. It keeps a buffer that can be saved to a file. By convention AudioRecorder is usually written in mixed case even as we prefer upper case for threading types.

> > **Parameters parent** (diwacs.GraphicalUserInterface) – Parent of the thread.

> **find_input_device**()
> > Find a microphone device.

> **open_mic_stream**()
> > Opens the stream object for microphone.

> **run**()
> > Continuously record from the microphone to the buffer.

> > The size should be limited at diwavars.MAX_LENGTH constant. The implementation keeps only the most recent data in the case that there's too much data to store.

> **save**(*event_id*, *path*)
> > Save the buffer to a file.

> **stop**()
> > Stop the audio recorder thread.

1.16.2 threads.checkupdate module

Created on 5.6.2013

> **author** neriksso

class `threads.checkupdate.`**`CHECK_UPDATE`**
> Thread for checking version updates.
>
> > **static** **`get_pad`**()
> > > Returns the padfile object using PAD_URL setting.
> > >
> > > > **Returns** A Filelike object with additional methods geturl(), info() and getcode().
> >
> > **`run`**()
> > > Returns weather the update checking was successful.
> > >
> > > > **Return type** Boolean
> >
> > **`show_dialog`**(*url*)
> > > Shows the dialog that promps the user to download newer version of the software.
> > >
> > > > **Parameters** **url** (*String*) – URL address of the new version.

1.16.3 threads.common module

Created on 5.6.2013

> **author** neriksso

1.16.4 threads.connectionerror module

Created on 5.6.2013

> **author** neriksso

class `threads.connectionerror.`**`CONNECTION_ERROR_THREAD`**(*parent*)
> Thread for checking connection errors.
>
> > **Parameters** **parent** (*wx.Frame*) – Parent object.
>
> > **`run`**()
> > > Starts the thread.

1.16.5 threads.contextmenu module

Created on 27.6.2013

> **author** neriksso

class `threads.contextmenu.`**`ContextMenuFailure`**(*self*, *EventType* *type=wxEVT_NULL*, *int* *winid=0*)
> Represents a failure of CMFH initialization.

class `threads.contextmenu.`**`SEND_FILE_CONTEX_MENU_HANDLER`**(*parent*, *context*, *send_file*, *handle_file*)
> Thread for OS context menu actions like file sending to other node.
>
> > **Parameters**
> >
> > > • **context** (`zmq.Context`) – ZeroMQ Context for creating sockets.

- **send_file** (*Function*) – Sends files.

- **handle_file** (*Function*) – Handles files.

run()
>   Starts the thread.

stop()
>   Stops the thread.

1.16.6 threads.current module

Created on 27.6.2013

>   **author** neriksso

class threads.current.**CURRENT_PROJECT**(*swnp*)
>   Thread for transmitting current project selection. When user selects a project, an instance is started. When a new selection is made, by any DiWaCS instance, the old instance is terminated.
>
>   **Parameters**
>
>   - **project_id** (*Integer*) – Project id from the database.
>
>   - **swnp** (swnp.SWNP) – SWNP instance for sending data to the network.

run()
>   Starts the thread.

class threads.current.**CURRENT_SESSION**(*swnp*)
>   Thread for transmitting current session id, when one is started by the user. When the session is ended, by any DiWaCS instance, the instance is terminated.
>
>   **Parameters**
>
>   - **session_id** (*Integer*) – Session id from the database.
>
>   - **swnp** (swnp.SWNP) – SWNP instance for sending data to the network.

run()
>   Starts the thread.

1.16.7 threads.diwathread module

Created on 5.6.2013

>   **author** neriksso

class threads.diwathread.**DIWA_THREAD**(*target=None*, *name=None*, *args=()*, *kwargs=None*)
>   Doc string here.

remove_self()
>   Removes self from the thread list, this should be used only when the thread is sure to die soon.

stop()
>   Stop the thread.

static **stop_all**()
>   Stop all program threads except the calling one.

stop_is_set()
>   Is the thread supposed to stop.

exception `threads.diwathread.`**`TimeoutException`**(*message*)
    Represents a thread timeout event.

1.16.8 threads.inputcapture module

Created on 5.6.2013

> **author** neriksso

class `threads.inputcapture.`**`INPUT_CAPTURE`**(*parent*, *swnp*)
    Thread for capturing input from mouse/keyboard.

> **Parameters**
>
>   • **parent** (`GUI`) – Parent instance.
>
>   • **swnp** (`swnp.SWNP`) – SWNP instance for sending data to the network.

`hook`()
    Add the input hooks to the system.

`on_keyboard_event`(*event*)
    Called when keyboard events are received.

`on_mouse_event`(*event*)
    Called when mouse events are received.

> •WM_MOUSEFIRST = 0x200
>
> •WM_MOUSEMOVE = 0x200
>
> •WM_LBUTTONDOWN = 0x201
>
> •WM_LBUTTONUP = 0x202
>
> •WM_LBUTTONDBLCLK = 0x203
>
> •WM_RBUTTONDOWN = 0x204
>
> •WM_RBUTTONUP = 0x205
>
> •WM_RBUTTONDBLCLK = 0x206
>
> •WM_MBUTTONDOWN = 0x207
>
> •WM_MBUTTONUP = 0x208
>
> •WM_MBUTTONDBLCLK = 0x209
>
> •WM_MOUSEWHEEL = 0x20A
>
> •WM_MOUSEHWHEEL = 0x20E

`reset_mouse_events`()
    Clear the mouse event queue.

`run`()
    Starts the thread.

`stop`()
    Stops the thread.

`unhook`()
    Remove the input hooks from the system.

class threads.inputcapture.**MOUSE_CAPTURE**(*parent*, *swnp*)

A thread for capturing mouse movements and sending them to remote controlled systems.

> **Parameters**
>
> - **parent** (diwacs.GraphicalUserInterface) – The main GUI.
>
> - **swnp** (swnp.SWNP) – The network handler.

parse_mouse_events()

Routine that constantly parses mouse events in the queue.

threads.inputcapture.**set_capture**(*value*)

Set's the capture value for threads.

> **Parameters** **value** (*Boolean*) – Is the capture on.

1.16.9 threads.worker module

Created on 27.6.2013

> **author** neriksso

class threads.worker.**SNAPSHOT_THREAD**(*path*)

Worker thread for taking snapshot.

> **Parameters** **path** (*String*) – File path where to store the snapshot.

run()

Worker procedure for storing the snapshot.

> **Warning:** This object has a timeout of 1 minute. So consider terminating the thread on shutdown if it's hanging.

class threads.worker.**WORKER_THREAD**(*parent*)

Worker thread for non-UI jobs.

> **Parameters** **parent** – The GUI object.

static add_project_registry_entry(*reg_type*)

Adds "Add to project" context menu item to registry. The item will be added to Software-Classes<reg_type>, where <reg_type> can be e.g. '*' for all files or 'Folder' for folders.

> **Parameters** **reg_type** (*String*) – Registry type.

static add_registry_entry(*name*, *node_id*)

Adds a node to registry.

> **Parameters**
>
> - **name** (*String*) – Node name.
>
> - **id** (*Integer*) – Node id.

check_responsive()

Determine the responsive node.

create_event(*title*)

Create a new event.

> **Parameters** **title** (*String*) – Title of the event.

> **parse_config**(*config_object*)
>   Handles config file settings.

> static **remove_all_registry_entries**()
>   Removes all related registry entries.

> **run**()
>   Run the worker thread.

1.17 Utils module

Created on 17.5.2013

> **author** neriksso

utils.**DottedIPToInt**(*dotted_ip*)
>   Transforms a dotted IP address to Integer.

> > **Parameters dotted_ip** (*String*) – The IP address.

> > **Returns** The IP address.

> > **Return type** Integer

utils.**GetLocalIPAddress**(*target*)
>   Used to get local Internet Protocol address.

> > **Returns** The current IP address.

> > **Return type** string

utils.**GetMacForIp**(*ip*)
>   Returns the mac address for an local IP address.

> > **Parameters ip** (*String*) – IP address

utils.**IterIsLast**(*iterable*) → generates (item, islast) pairs.
>   Generates pairs where the first element is an item from the iterable source and the second element is a boolean
>   flag indicating if it is the last item in the sequence.

> > **Parameters iterable** (*iterable*) – The iterable element.

utils.**MapNetworkShare**(*letter*, *share=None*)
>   Maps the network share to a letter.

> > **Parameters**

> > > • **letter** (*String*) – The letter for which to map.

> > > • **share** (*String*) – The network share, defaults to None which unmaps the letter.

utils.**get_encrypted_directory_name**(*name*, *hashed_password*)
>   Returns the encrypted name for project directory.

utils.**hash_password**(*password*)
>   Hashes the provided password.

BUGS

Bug	Description	Status
Sample bug	Description for sample	Open / Closed / Will not be fixed

THREE

FEATURES

Feature	Description
Project	User can add, edit and select a project
Session	User can start, end and continue sessions
Event	User can tag an interesting event during a session
File Monitoring	Users' file actions are monitored during a session. It includes opening files.

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22. 1.1

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FIVE

USER INTERFACE

Figure 5.1: The UI of DiWaCS; Several icons for different functions.

The screen icons identify different screens nodes. The user can drop files on to these icons, causing the dropped files to be opened in the specific node. The arrows control the carousel of nodes, and are visble only if more than three nodes are connected. The drop-down list in holds recently viewed files in the selected project.

Table 5.1: Icons explained

Icon	Description
Briefcase	Select a project
Clock	Start / End a session
Folder	Open project directory
Note	Create an Event note
Circle	Hide the application
Cross	Exit the application

INDICES AND TABLES

- *genindex*
- *modindex*
- *search*