Ajenti

Release 1.2.22.23

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Contents

CHAPTER 1

Documentation

1.1 FAQ

1.1.1 How do I add domains/PHP/email accounts/websites?

Pure Ajenti is a **server control** panel, not a **hosting control** panel. You need the Ajenti V add-on for web-hosting stuff: http://ajenti.org/#product-ajenti-v.

1.1.2 I forgot my password

Open /etc/ajenti/config.json, look for your user entry, and replace whole password hash entry with a new plaintext password. Restart Ajenti. Click "save" under "Configuration" to rehash the password.

1.1.3 My OS isn't supported, but I'm a brave adventurer

```
pip install ajenti
```

1.2 Installation

1.2.1 Debian Packages

Ajenti requires Debian 6 or later. Debian 5 might work with Python 2.6 installed.

Debian Squeeze requires squeeze-backports repository: http://backports.debian.org/Instructions/

Add repository key:

```
wget http://repo.ajenti.org/debian/key -O- | apt-key add -
```

Add repository to /etc/apt/sources.list:

```
echo "deb http://repo.ajenti.org/debian main main debian" >> /etc/apt/sources.list
```

Install the package:

```
apt-get update && apt-get install ajenti
```

Start the service:

```
service ajenti restart
```

1.2.2 Ubuntu Packages

Ajenti requires ubuntu 12.04 Precise Pangolin. Previous releases might work with Python upgraded.

Add repository key:

```
wget http://repo.ajenti.org/debian/key -O- | apt-key add -
```

Add repository to /etc/apt/sources.list:

```
echo "deb http://repo.ajenti.org/ng/debian main main ubuntu" >> /etc/apt/sources.list
```

Install the package:

```
apt-get update && apt-get install ajenti
```

Start the service:

```
service ajenti restart
```

1.2.3 RPM Packages

Ajenti requires EPEL repositories: http://fedoraproject.org/wiki/EPEL

Add repository key:

```
wget http://repo.ajenti.org/ajenti-repo-1.0-1.noarch.rpm
rpm -i ajenti-repo-1.0-1.noarch.rpm
```

Install the package:

```
yum install ajenti
```

Start the service:

```
service ajenti restart
```

Note: Package does not match intended download?

```
yum clean metadata
```

1.2.4 FreeBSD Installation

Prerequisites:

```
cd /usr/ports/devel/py-gevent;  make install clean;
cd /usr/ports/devel/py-lxml;    make install clean;
cd /usr/ports/devel/py-pip;     make install clean;
cd /usr/ports/net/py-ldap2;     make install clean;
cd /usr/ports/security/stunnel; make install clean;
```

Download and install latest Ajenti build from PYPI:

```
pip install ajenti
```

Install rc.d script:

```
wget https://raw.github.com/ajenti/ajenti/master/packaging/files/ajenti-bsd -O /etc/rc.d/ajenti
```

1.3 Running Ajenti

1.3.1 Starting service

Packages install binary *ajenti-panel* and initscript *ajenti*. You can ensure the service is running:

```
service ajenti restart
```

or:

```
/etc/init.d/ajenti restart
```

Ajenti can be run in a verbose debug mode:

```
ajenti-panel -v
```

The panel will be available on **HTTPS** port **8000** by default. The default username is **root**, and the password is **admin**

1.3.2 Commandline options

- **-c**, **–config <file>** - Use given config file instead of default
- **-v** - Debug/verbose logging
- **-d, –daemon** - Run in background (daemon mode)
- **–set-platform <id>** - Override OS detection

1.3.3 Debugging

Running ajenti with `-v` enables additional logging and Exconsole emergency console (see https://github.com/Eugeny/exconsole).

Exconsole can be triggered by a crash, sending SIGQUIT or pressing `Ctrl-\` on the controlling terminal.

CHAPTER 2

Developers

2.1 Getting Started with Plugin Development

2.1.1 Prerequisites

The following are the absolutely minimal set of software required to build and run Ajenti:

- git
- coffee-script (use NPM)
- lessc (use NPM)

If you don't have CoffeeScript or LESS compiler, you won't be able to make changes to Ajenti CSS/JS files. In this case, download sources from PyPI, which includes compiled CSS/JS resources.

Debian/Ubuntu extras:

- apt-show-versions
- python-dbus (ubuntu)

2.1.2 Setting up

Download the source:

```
git clone git://github.com/ajenti/ajenti.git -b 1.x
```

(or download them from PyPI: https://pypi.python.org/pypi/ajenti)

Install the dependencies:

```
[sudo] pip install -Ur requirements.txt
```

Launch Ajenti in debug mode:

```
make run
```

Navigate to http://localhost:8000/.

Press Ctrl-at any time to launch an interactive Python shell and Ctrl-D to resume Ajenti.

CoffeeScript and LESS files will be recompiled automatically when you refresh the page; Python code will not. Additional debug information will be available in the console output and browser console.

Ajenti source code includes various example plugins under **Demo** category; their source is available in `ajenti/plugins/test` directory.

2.1.3 Creating new plugin package

New plugins can be placed in both `<source>/ajenti/plugins/` (if you expect inclusion in the source tree) and `/var/lib/ajenti/plugins`.

Each plugin package consists of few Python modules, which contain *`ajenti.api.plugin`* classes (*plugins*). Packages also may contain *static files, CoffeeScript and LESS code*, and XML user interface layouts:

```
* ajenti
  * plugins
    * test
      * content
        * css
          - 1.less
        * js
          - 2.coffee
        * static
          - 3.png
      * layout
        - 4.xml
      - __init__.py
      - main.py
```

2.1.4 Plugins

To get started, create an empty directory `<source>/ajenti/plugins/test`.

Place a file called `__init__.py` there:

```
from ajenti.api import *
from ajenti.plugins import *


info = PluginInfo(
    title='Test',
    icon=None,
    dependencies=[
        PluginDependency('main'),
    ],
)


def init():
    import main
```

In the same directory, create module `main.py`. The comments explain the concept behind plugins architecture:

```
from ajenti.api import *


@interface
class IShape (object):
    """
    This is an interface, specifying the methods required.
```

```
    """
    def number_of_corners(self):
        pass


@plugin
class Square (BasePlugin, IShape):
    """
    A sample implementation, note the inheritance from both BasePlugin (optional but gives extra opti
    """

    def init(self):
        """
        init() methods are automatically called for plugins, maintaining inheritance hierarchy
        """
        print 'Square #%s initialized' % id(self)

    def number_of_corners(self):
        return 4


@plugin
class Circle (BasePlugin, IShape):
    def number_of_corners(self):
        return 0



print 'IShape is implemented by', IShape.get_class()
foo = IShape.get()  # get/create any instance of any IShape implementation
# or, more verbose, IShape.get_class().new()
print 'foo corners:', foo.number_of_corners()

# The instances are by default singleton:
print foo == IShape.get()  # True

# But you can create separate ones:
foo2 = IShape.get_class().new()
print foo == foo2  # False, different instances


for another_foo in IShape.get_all():  # iterate over all possible IShape implementations
    print '\n%s says:' % another_foo, another_foo.number_of_corners()


print IShape.get_instances()  # lists all three active IShape instances
```

Output:

```
IShape is implemented by <class 'ajenti.plugins.test.main.Square'>
Square #24838864 initialized
foo corners: 4
True
Square #24838928 initialized
False

<ajenti.plugins.test.main.Square object at 0x17b02d0> says: 4
<ajenti.plugins.test.main.Circle object at 0x17b0390> says: 0
[<ajenti.plugins.test.main.Square object at 0x17b02d0>, <ajenti.plugins.test.main.Square object at 0x
```

Learn about more interface and plugin methods here: *ajenti.api.plugin*

Continue to *User Interface*

2.2 User Interface

2.2.1 Theory

The whole Ajenti UI is a DOM tree of *ajenti.ui.UIElement* objects. After each update, the UI tree is serialized into JSON and sent to browser, where HTML DOM is assembled from it with the help of CoffeeScript code. Unlike conventional web apps, Ajenti is a stateful machine, which means you adopt a simple workflow similar to developing desktop apps, not websites.

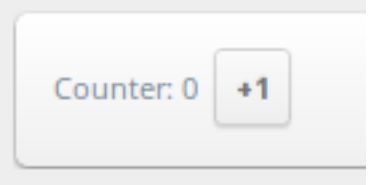
2.2.2 Example

```
from ajenti.api import *
from ajenti.plugins.main.api import SectionPlugin
from ajenti.ui import on


@plugin
class TestPlugin (SectionPlugin):
    def init(self):
        self.title = 'Test'  # those are not class attributes and can be only set in or after init()
        self.icon = 'question'
        self.category = 'Demo'

        """
        UI Inflater searches for the named XML layout and inflates it into
        an UIElement object tree
        """
        self.append(self.ui.inflate('test:main'))

        self.counter = 0
        self.refresh()

    def refresh(self):
        """
        Changing element properties automatically results
        in an UI updated being issued to client
        """
        self.find('counter-label').text = 'Counter: %i' % self.counter

    @on('increment-button', 'click')
    def on_button(self):
        """
        This method is called every time a child element
        with ID 'increment-button' fires a 'click' event
        """
        self.counter += 1
        self.refresh()
```

Add a subdirectory `layout` and place a file named `main.xml` there:

```
<body> <!-- an overall plugin container panel -->
    <pad> <!-- adds whitespace padding -->
        <hc> <!-- horizontal container -->
            <label id="counter-label" />
            <button id="increment-button" text="+1" style="mini" />
        </hc>
    </pad>
</body>
```

Now restart Ajenti. The new plugin **Test** will be visible under **Demo** category. Clicking the **+1** button will increase the counter.



The visible part of plugin is an UIElement, inherited from `ajenti.plugins.main.api.SectionPlugin`.

When you click the button, the 'click' even is fired down the UI tree. The first method to have correctly decorated `@on` method will handle the event. Alternatively, you can set event handler on the element itself by adding this code to `init`:

```
self.find('increment-button').on('click', self.on_button)
```

2.2.3 List of UI Elements

2.2.4 Containers

<box>: Box

Simplest container ever, can be scrollable

```
@p('width', default=None)
@p('height', default=None)
@p('scroll', default=False, type=bool)
```

<pad>: Whitespace

Adds a padding on four sides.

<indent>: Indentation

Adds a padding on two sides.

<right>: Pull-to-right

Pulls its content to right with `float: right`

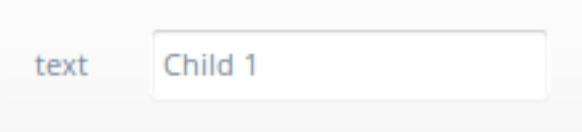
<hc>: Horizontal Container

A horizontal stacking container

<vc>: Vertical Container

A vertical stacking container

<formline>: Form Line



Container for form controls, has a caption

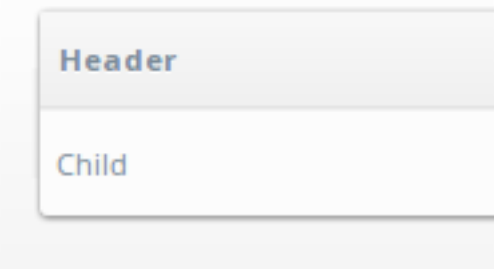
```
@p('text', default='', bindtypes=[str, unicode])
```

<formgroup>: Form Group

Provides a nice form section separator

```
@p('text', default='', bindtypes=[str, unicode])
```

<dt>, <dtr>, <dth> <dtd>: Data Table



A lined table

```
<dt>
    <dtr>
        <dth text="Header" />
    </dtr>
    <dtr>
        <dtd>
            <label text="Child" />
```

```
        </dtd>
    </dtr>
</dt>
```

<collapserow>: Collapsible Table Row

A click-to expand table row

```
<dt>
    <collapserow>
        <label text="Header Child" />
        <label text="Body Child" />
    </collapserow>
</dt>
```

First child is a header and always visible. Second is the collapsible body.

```
@p('expanded', default=False, type=bool, bindtypes=[bool])
```

<lt>, <ltr>, <ltd>: Layout Table

An invisible layout grid (no padding).

<sortabledt>: Sortable Data Table

User will be able to reorder rows

```
<sortabledt>
    <dtr>
        <dtd>
            <label text="Child 1" />
        </dtd>
    </dtr>
    <dtr>
        <dtd>
            <label text="Child 2" />
        </dtd>
    </dtr>
    <dtr>
        <dtd>
            <label text="Child 3" />
```

```
        </dtd>
    </dtr>
</sortabledt>

@p('sortable', default=True, type=bool)
@p('order', default='', type=str)
```

The **order** property holds the reordered element indexes (`[2,1,3]` as seen on the image)

<tabs>, <tab>: Tabs

User will be able to reorder rows

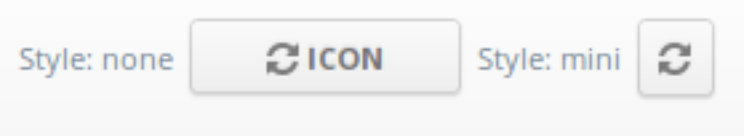
```
<tabs>
    <tab title="1">
        <label text="Child 1" />
    </tab>
    <tab title="2">
        <label text="Child 2" />
    </tab>
    <tab title="3">
        <label text="Child 3" />
    </tab>
</tabs>

<tabs>:
@p('active', default=0)

<title>:
@p('title', default='', bindtypes=[str, unicode])
```

2.2.5 Standard Controls

<label>: Label

@p('text', default='', bindtypes=[str, unicode, int, float])

<button>: Button



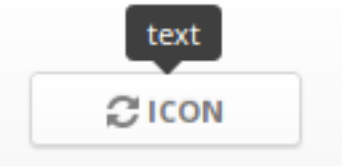
```
@p('text', default='', bindtypes=[str, unicode])
@p('icon', default=None)
@p('warning', default=None)  # display a warning text before click

click()  # fired on click
```

<icon>: Inline Icon

Icon IDs in Ajenti are coming from this page: http://fortawesome.github.io/Font-Awesome/icons/

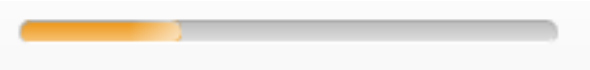
@p('icon', default=None, bindtypes=[str, unicode])

<tooltip>: Tooltip



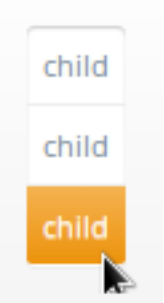

```
@p('text', default='', bindtypes=[str, unicode, int])
```

<progressbar>: Progress Bar



```
@p('width', default=None)
@p('value', default=0, type=float, bindtypes=[float]) # between 0.0 and 1.0
```

<list>, <listitem>: Lists



A list with clickable items:

```
<list>
    <listitem>
        <label text="child" />
    </listitem>
    <listitem>
        <label text="child" />
    </listitem>
```

```
    <listitem>
        <label text="child" />
    </listitem>
</list>

<listitem>:
click()  # fired on click
```

2.2.6 Inputs

<textbox>: Textbox

```
@p('value', default='', bindtypes=[str, unicode, int])
@p('type', default='text')  # or 'integer'
```

<editable>: Editable Label

A label that becomes textbox when clicked:

```
@p('value', default='', bindtypes=[str, unicode])
@p('icon', default=None)
```

<checkbox>: Checkbox

```
@p('text', default='')
@p('value', default=False, bindtypes=[bool])
```

<dropdown>: Dropdown Select

```
@p('labels', default=[], type=list)
@p('values', default=[], type=list)
@p('value', default='', bindtypes=[str, int, unicode])
```

<combobox>: Combo Box

```
@p('labels', default=[], type=list)
@p('values', default=[], type=list)
@p('separator', default=None, type=str) # if set, combobox becomes autocomplete-multiple-input-box
@p('value', default='', bindtypes=[str, unicode])
```

2.3 Plugin resources

Plugin resource files are contained under `content` directory nested in the plugin directory. The `content` directory can optionally contain `css`, `js` and `static` directories holding files of respective types.

Ajenti will accept following filename extensions. `injected` resources will be added to `<head>` of web UI. `cleaned` resources will be deleted before build. `compile` resources will be pre-processed using applicable compiler.

- `/content/js/*.js` - source JS (compile)
- `/content/css/*.css` - source JS (compile)
- `/content/js/*.coffee` - source CoffeeScript (compile)
- `/content/css/*.less` - source LESS (compile)
- `/content/css/*.i.less` - source LESS included somewhere else (ignored)
- `/content/js/*.m.js` - pre-built JS (injected)
- `/content/css/*.m.css` - pre-built CSS (injected)
- `/content/js/*.c.js` - compiled JS (injected, cleaned)
- `/content/css/*.c.css` - compiled CSS (injected, cleaned)

Resources under `/static/` are served over HTTP at the following URL: `/ajenti:static/<plugin-name>/<resource-path>`, e.g.: `/ajenti:static/main/favicon.png`.

2.4 Notifications

2.4.1 Example

Code:

```
from ajenti.api import plugin
from ajenti.plugins.main.api import SectionPlugin
from ajenti.ui import on


@plugin
class Test (SectionPlugin):
    def init(self):
        self.title = 'Notifications'
        self.icon = 'smile'
        self.category = 'Demo'

        self.append(self.ui.inflate('test_notifications:main'))
        self.find('style').labels = self.find('style').values = ['info', 'warning', 'error']

    @on('show', 'click')
    def on_show(self):
        self.context.notify(self.find('style').value, self.find('text').value)
```

Layout:

```
<body>
    <pad>
        <vc>
            <formline text="Text">
                <textbox id="text" />
            </formline>
            <formline text="Style">
                <dropdown id="style" />
```

```
            </formline>
            <formline>
                <button icon="ok" id="show" text="Show" />
            </formline>
        </vc>
    </pad>
</body>
```

Download this example

2.5 Bindings

Binding mechanism lets you bind your Python objects directly to UI elements and build CRUD interfaces in minutes.

Example: https://github.com/Eugeny/ajenti/blob/dev/ajenti/plugins/test/binder/main.py

2.5.1 Simple bindings

Code:

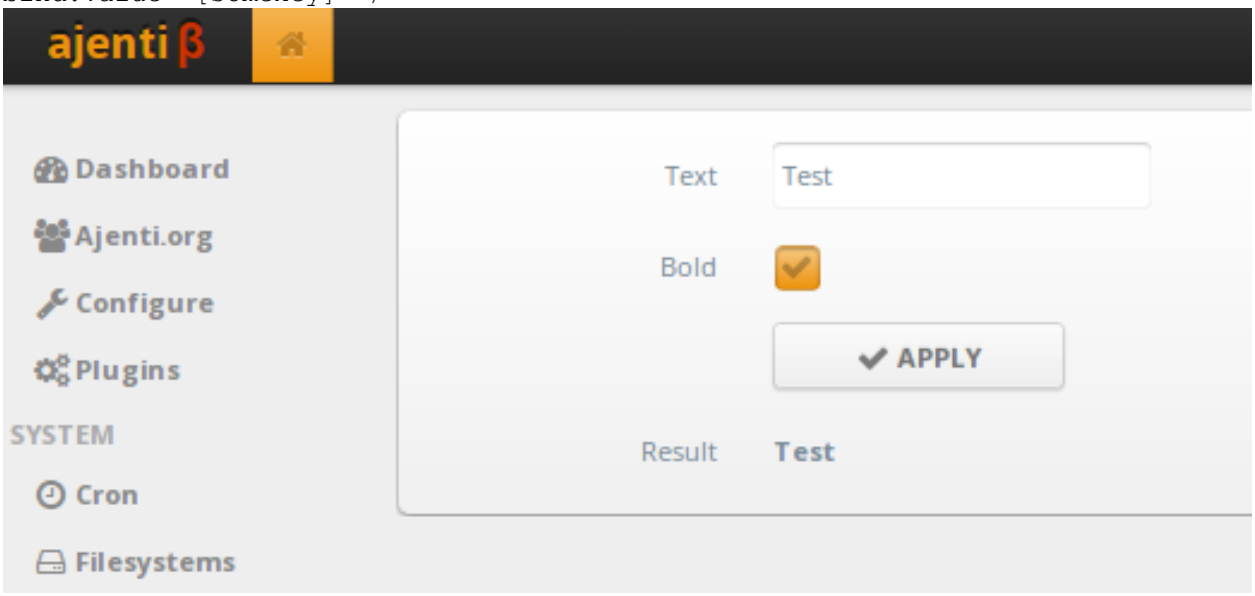
```
from ajenti.api import plugin
from ajenti.plugins.main.api import SectionPlugin
from ajenti.ui import on
from ajenti.ui.binder import Binder


class Settings (object):  # use new-style object at all times!
    def __init__(self):
        self.label_text = ''
        self.label_bold = False
        self.label_style = ''


@plugin
class Test (SectionPlugin):
    def init(self):
        self.title = 'Bindings'
        self.icon = 'smile'
        self.category = 'Demo'

        self.append(self.ui.inflate('test_bindings:main'))

        self.settings = Settings()

        # Bind the settings object to the section UI element (self)
        self.binder = Binder(self.settings, self)
        self.binder.populate()

    @on('apply', 'click')
    def on_apply(self):
        self.binder.update()  # update objects from UI
        self.settings.label_style = 'bold' if self.settings.label_bold else ''
        self.binder.populate()  # update UI with objects
```

Here, the `Settings` object acts as a data model. *`ajenti.ui.binder.Binder`* object connects data with UI. `autodiscover` method scans the UI for bindable elements, `populate` method updates UI with the data from bound objects, and `update` method applies UI changes to objects.

Layout:

```
<body>
    <pad>
        <vc>
            <formline text="Text">
                <textbox bind="label_text" />
            </formline>
            <formline text="Bold">
                <checkbox bind="label_bold" />
            </formline>
            <formline>
                <button icon="ok" id="apply" text="Apply" />
            </formline>
            <formline text="Result">
                <label bind:text="label_text" bind:style="label_style" />
            </formline>
        </vc>
    </pad>
</body>
```

We have added `bind` attributes to the elements which are to be auto-populated with values. If you want to bind multiple properties, use XML attributes like `bind:text` or `bind:style`. Dictionary values and `__getattr__` powered indexers can be bound by enclosing the key name in square brackets, e.g.: `<label bind:value="[somekey]" />`



If you would like to continue binding on a nested object, use `binder:context` attribute:

```
<body>
    <vc>
        <label bind:value="simple_str_field" />    <!-- data.simple_str_field -->
        <box binder:context="object_field">
            <label bind:value="objects_str_field" />   <!-- data.object_field.objects_str_field -->
        </box>
        <box binder:context="dict_field">
```

```
            <label bind:value="[dict_key]" />  <!-- data.dict_field['dict_key'] -->
        </box>
    </vc>
</body>
```

2.5.2 Collection Bindings

Ajenti supports following collection bindings:

- Binding iterable to list of elements (*ajenti.ui.binder.ListAutoBinding*)
- Binding dict to key-annotated elements (*ajenti.ui.binder.DictAutoBinding*)
- Binding iterable with a child template (*ajenti.ui.binder.CollectionAutoBinding*)

Code:

```
import json

from ajenti.api import plugin
from ajenti.plugins.main.api import SectionPlugin
from ajenti.ui import on
from ajenti.ui.binder import Binder


class Person (object):
    def __init__(self, name, **kwargs):
        self.name = name
        self.params = kwargs

    def __repr__(self):
        return json.dumps({'name': self.name, 'params': self.params})


@plugin
class Test (SectionPlugin):
    def init(self):
        self.title = 'Collection Bindings'
        self.icon = 'smile'
        self.category = 'Demo'

        self.append(self.ui.inflate('test_bindings_collections:main'))

        andy = Person('andy', phone='123')
        bob = Person('bob', phone='321')

        self.obj_list = (andy, bob)
        self.obj_collection = [andy, bob]

        # This callback is used to autogenerate a new item with 'Add' button
        self.find('collection').new_item = lambda c: Person('new person', phone='000')

        self.binder = Binder(self, self)
        self.refresh()

    def refresh(self):
        self.binder.update()
        self.raw_data = repr(self.obj_collection)
```

```
        self.binder.populate()

    @on('apply', 'click')
    def on_apply(self):
        self.refresh()
```

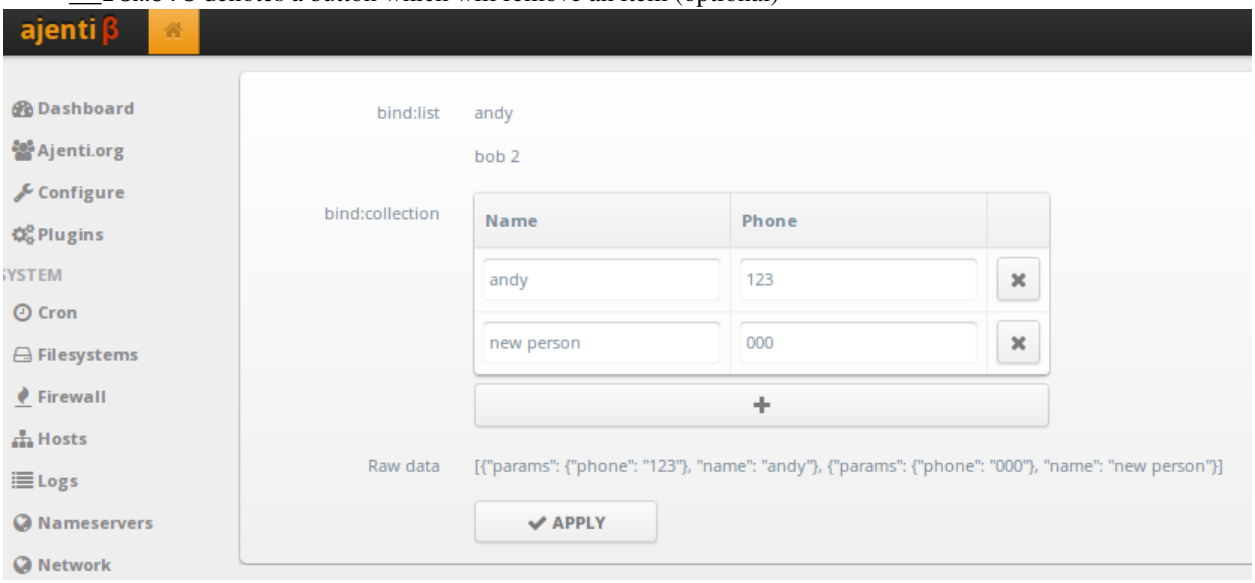
Layout:

```
<body>
    <pad>
        <vc>
            <formline text="bind:list">
                <bind:list bind="obj_list">
                    <box>
                        <label bind="name" />
                    </box>
                    <box>
                        <label bind="name" />
                    </box>
                </bind:list>
            </formline>

            <formline text="bind:collection">
                <bind:collection bind="obj_collection" id="collection">
                    <vc>
                        <dt bind="__items">
                            <dtr>
                                <dth text="Name" />
                                <dth text="Phone" />
                                <dth />
                            </dtr>
                        </dt>
                        <button icon="plus" style="mini" bind="__add" />
                    </vc>

                    <bind:template>
                        <dtr>
                            <dtd> <textbox bind="name" /> </dtd>

                            <dtd>
                                <bind:dict bind="params">
                                    <textbox bind="phone" />
                                </bind:dict>
                            </dtd>

                            <dtd> <button icon="remove" style="mini" bind="__delete" /> </dtd>
                        </dtr>
                    </bind:template>

                </bind:collection>
            </formline>

            <formline text="Raw data">
                <label bind="raw_data" />
            </formline>

            <formline>
                <button icon="ok" id="apply" text="Apply" />
            </formline>
```

```
        </vc>
    </pad>
</body>
```

Note the special `bind` attribute values used in `bind:collection`:

- `__items` denotes the container for items
- `__add` denotes a button which will generate a new item (optional)
- `__remove` denotes a button which will remove an item (optional)



2.6 Custom UI Controls

You can create any type of a reusable UI control. Remember to take a look at default controls in `ajenti/plugins/main` for guidance.

2.6.1 Example

In this example, we'll create a HTML5 slider control.

Code:

```
from ajenti.api import plugin
from ajenti.plugins.main.api import SectionPlugin
from ajenti.ui import on, p, UIElement


@plugin
class Test (SectionPlugin):
    def init(self):
        self.title = 'Controls'
        self.icon = 'smile'
        self.category = 'Demo'
        self.append(self.ui.inflate('test_controls:main'))

    @on('check', 'click')
```

```
    def on_show(self):
        self.context.notify('info', 'Value is %i' % self.find('slider').value)


@p('value', type=int, default=0)
@plugin
class Slider (UIElement):
    typeid = 'slider'
```

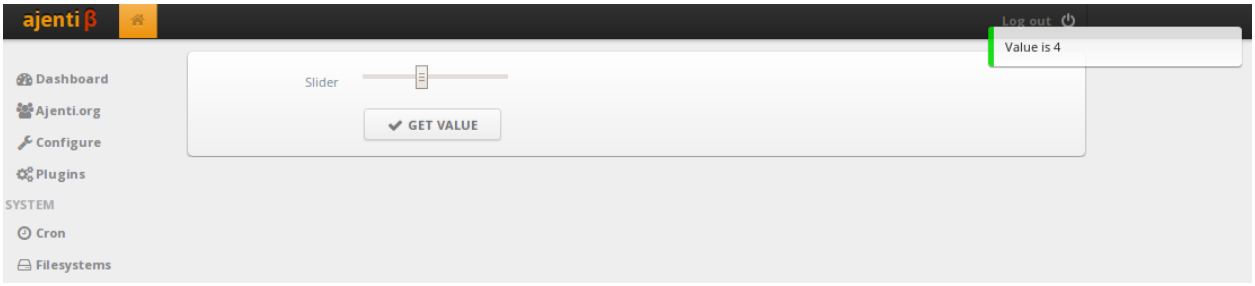
Layout:

```
<body>
    <pad>
        <vc>
            <formline text="Slider">
                <slider id="slider" value="0" />
            </formline>
            <formline>
                <button icon="ok" id="check" text="Get value" />
            </formline>
        </vc>
    </pad>
</body>
```

Control class is decorated with *ajenti.ui.p()* for each of its properties. The main client-side logic is implemented through CoffeeScript code (though you can try to get away with pure-JS).

CoffeeScript:

```
class window.Controls.slider extends window.Control
    createDom: () ->
        # createDom() must return HTML
        """
            <div>
                <input type="range" min="0" max="10" />
            </div>
        """

    setupDom: (dom) ->
        # setupDom may attach event handler and perform other DOM manipulations
        # use this.properties hash to populate control with its current state
        super(dom)
        @input = $(@dom).find('input')
        @input.val(@properties.value)

    detectUpdates: () ->
        # detectUpdates() should return a hash containing only changed properties
        # be sure to not report unchanged properties since this will lead to infinite update loops
        r = {}
        value = parseInt(@input.val())
        if value != @properties.value
            r.value = value
        return r
```



Download this example

2.7 Handling HTTP Requests

2.7.1 Example

This example illustrates various HTTP responses. Try following URLs:

- http://localhost:8000/ajenti:demo/notify?text=hello
- http://localhost:8000/ajenti:demo/respond/redirect
- http://localhost:8000/ajenti:demo/respond/server_error
- http://localhost:8000/ajenti:demo/respond/ok
- http://localhost:8000/ajenti:demo/respond/file

Code:

```
from ajenti.api import plugin, BasePlugin
from ajenti.api.http import HttpPlugin, url


@plugin
class HttpDemo (BasePlugin, HttpPlugin):
    @url('/ajenti:demo/notify')
    def get_page(self, context):
        if context.session.identity is None:
            context.respond_redirect('/')
        self.context.notify('info', context.query.getvalue('text', ''))
        context.respond_ok()
        return ''

    @url('/ajenti:demo/respond/(?P<what>.+)')
    def get_response(self, context, what=None):
        if what == 'ok':
            context.respond_ok()
            return 'Hello!'
        if what == 'redirect':
            return context.respond_redirect('/')
        if what == 'server_error':
            return context.respond_server_error()
        if what == 'forbidden':
            return context.respond_forbidden()
        if what == 'not_found':
            return context.respond_not_found()
```

```
        if what == 'file':
            return context.file('/etc/issue')
```

Download this example

2.8 Dashboard Widgets

Dashboard plugin API exposes two widget types: *ajenti.plugins.dashboard.api.DashboardWidget* and *ajenti.plugins.dashboard.api.ConfigurableWidget*.

2.8.1 Simple widget

Example:

```
from ajenti.api import plugin
from ajenti.plugins.dashboard.api import DashboardWidget

@plugin
class HelloWidget (DashboardWidget):
    name = 'Hello Widget'
    icon = 'comment'

    def init(self):
        self.append(self.ui.inflate('hello_widget:widget'))
        self.find('text').text = 'Hello'
```

Layout:

```
<hc>
    <box width="20">
        <icon id="icon" icon="comment" />
    </box>

    <box width="90">
        <label id="name" style="bold" text="Widget" />
    </box>

    <label id="text" />
</hc>
```

2.8.2 Configurable widget

Configurable widgets have a `dict` config, configuration dialog and a configuration button.

Example (real dashboard Text widget):

```
from ajenti.api import plugin
from ajenti.plugins.dashboard.api import ConfigurableWidget


@plugin
class TextWidget (ConfigurableWidget):
    name = _('Text')
    icon = 'font'
```

```
    def on_prepare(self):
        # probably not configured yet!
        self.append(self.ui.inflate('dashboard:text'))

    def on_start(self):
        # configured by now
        self.find('text').text = self.config['text']

    def create_config(self):
        return {'text': ''}

    def on_config_start(self):
        # configuration begins now, a chance to fill the configuration dialog
        pass

    def on_config_save(self):
        self.config['text'] = self.dialog.find('text').value
```

Layout:

```
<hc>
    <label id="text" text="---" />

    <dialog id="config-dialog" visible="False">
        <pad>
            <formline text="{Text}">
                <textbox id="text" />
            </formline>
        </pad>
    </dialog>
</hc>
```

CHAPTER 3

API Reference

3.1 ajenti

ajenti.**config** = **None**
Loaded config, is a *reconfigure.items.ajenti.AjentiData*

ajenti.**platform** = **None**
Current platform

ajenti.**platform_string** = **None**
Human-friendly platform name

ajenti.**platform_unmapped** = **None**
Current platform without "Ubuntu is Debian"-like mapping

ajenti.**installation_uid** = **None**
Unique installation ID

ajenti.**version** = **None**
Ajenti version

ajenti.**server** = **None**
Web server

ajenti.**debug** = **False**
Debug mode

ajenti.**init**()

ajenti.**exit**()

ajenti.**restart**()

3.2 ajenti.api

class ajenti.api.**PluginInfo**(***kwargs*)
Describes a loaded plugin package

class ajenti.api.**BasePlugin**
A base plugin class that provides *AppContext* and classconfig functionality.

classconfig_editor = **None**
Override this in your class with an ajenti.plugins.configurator.api.ClassConfigEditor derivative

classconfig_name = None
Override this in your class if you want this plugin to be configurable through Configure > Plugins

classconfig_root = False
When True, classconfig will be stored in root's config section disregarding current user

context = None
Automatically receives a reference to the current *AppContext*

create_classconfig()

default_classconfig = None
Override this in your class with a default config object (must be JSON-serializable)

init()
Do your initialization here. Correct bottom-to-up inheritance call order guaranteed.

load_classconfig()
Loads the content of `classconfig` attribute from the user's configuration section.

open_content(*path*, *mode='r'*)
Provides access to plugin-specific files from `/content` directory of the package

Parameters

- **path** (*str*) – path relative to package's `/content`
- **mode** (*str*) – Python file access mode

Returns An open file object

Return type file

save_classconfig()
Saves the content of `classconfig` attribute into the user's configuration section.

class `ajenti.api.`**AppContext**(*parent*, *httpcontext*)
A session-specific context provided to everyone who inherits *BasePlugin*.

session
current HTTP session: `ajenti.middleware.Session`

user
current logged in user: `reconfigure.items.ajenti.UserData`

Methods injected by MainPlugin:

notify(*text*)

Parameters **text** – Notification text to show

launch(*id*, **args*, ***kwargs*)

Parameters **id** – Intent ID to be launched

`ajenti.api.`**plugin**(*cls*)
A decorator to create plugin classes:

```
@plugin
class SomePlugin (ISomething):
    pass
```

If the class has a `verify` method returning `bool`, it's invoked. If the method returned `False`, plugin is rejected and removed from implementation lists.

If the class has a `platforms` attribute, which is a list of supported platform names, it's compared against the current runtime OS platform. If the current platform is not in the list, plugin is also rejected.

Following class methods are injected.

.get(*context=<current context>*)

Returns any existing instance or creates a new one

.new(**args*, *context=<current context>*, ***kwargs*)

Returns a new instance. Use this method instead of constructor, since it invokes the proper initialization chain and registers the instance

Return type class, None

ajenti.api.**rootcontext**(*cls*)
Enforces use of root PluginContext by default for .get() and .new() classmethods.

ajenti.api.**notrack**(*cls*)
Disables instance tracking of plugin (and derivative) instances within PluginContext via get/get_all and similar methods.

Return type class

ajenti.api.**notrack_this**(*cls*)
Disables instance tracking of plugin instances within PluginContext via get/get_all and similar methods.

Return type class

ajenti.api.**track**(*cls*)
Enables previously disabled instance tracking of plugin.

Return type class

ajenti.api.**persistent**(*cls*)
Makes this plugin non-GCable

Return type class

ajenti.api.**extract_context**()
An utility function that extracts and returns the nearest *AppContext* from the current call stack.

Return type *ajenti.plugins.PluginContext*, None

exception ajenti.api.**NoImplementationsError**

ajenti.api.**interface**(*cls*)
A decorator to create plugin interfaces:

```
@interface
class ISomething (object):
    def contract(self):
        pass
```

Following class methods are injected:

.get(*context=<current context>*)

Returns any existing instance or creates a new one

.get_all(*context=<current context>*)

Returns list of instances for each implementation

.get_class()

Returns any implementation class

.get_classes()

Returns list of implementation classes

.get_instances(*context=<current context>*)

Returns list of all existing instances

Return type class

3.3 ajenti.api.http

3.4 ajenti.api.sensors

class ajenti.api.sensors.**Sensor**

Base class for a Sensor. Sensors measure system status parameters and can be queried from other plugins.

static find(*id*)

Returns a Sensor by name

Parameters **id** (*str*) – sensor ID

Return type *Sensor*, None

get_variants()

Override this and return a list of available variants.

Return type list

id = None

init()

measure(*variant=None*)

Override this and perform the measurement.

Parameters **variant** (*str, None*) – variant to measure

Return type int, float, tuple, list, dict, str

timeout = 0

value(*variant=None*)

Returns sensor's measurement for a specific *variant*. Sensors can have multiple variants; for example, disk usage sensor accepts device name as a variant.

Parameters **variant** (*str, None*) – variant to measure

Return type int, float, tuple, list, dict, str

3.5 ajenti.http

3.6 ajenti.ipc

class ajenti.ipc.**IPCHandler**

Interface for custom IPC endpoints

get_name()
Should return short identifier of IPC endpoint:

$ ajenti-ipc <endpoint-name> <args>

Rtype str

handle(*args*)
Override to handle IPC requests

Parameters **args** (*list*) – list of *str* parameters

class ajenti.ipc.**IPCServer**

run()

start()

3.7 ajenti.middleware

3.8 ajenti.plugins

exception ajenti.plugins.**PluginLoadError**

exception ajenti.plugins.**PluginFormatError**

describe()

exception ajenti.plugins.**PluginCrashed**(*e*)

describe()

class ajenti.plugins.**Dependency**

exception Unsatisfied

describe()

reason()

Dependency.**build_exception**()

Dependency.**check**()

Dependency.**satisfied**()

Dependency.**value**

class ajenti.plugins.**ModuleDependency**(*module_name*)

exception Unsatisfied

reason()

ModuleDependency.**description = 'Python module'**

ModuleDependency.**is_satisfied**()

class ajenti.plugins.**PluginDependency**(*plugin_name*)

exception Unsatisfied

reason()

PluginDependency.**description = 'Plugin'**

PluginDependency.**is_satisfied**()

class ajenti.plugins.**BinaryDependency**(*binary_name*)

exception Unsatisfied

reason()

BinaryDependency.**description = 'Application binary'**

BinaryDependency.**is_satisfied**()

class ajenti.plugins.**FileDependency**(*file_name*)

exception Unsatisfied

reason()

FileDependency.**description = 'File'**

FileDependency.**is_satisfied**()

class ajenti.plugins.**PluginContext**
Container of interfaces and plugins

get_instance(*cls*)

get_instances(*cls*)

instantiate(*cls*, **args*, ***kwargs*)

vacuum_instances()

class ajenti.plugins.**PluginManager**
Handles plugin loading and unloading

blacklist = []

context = <ajenti.plugins.PluginContext object>

extra_location = '/var/lib/ajenti/plugins'

get_all()

get_implementations(*iface*)

get_order()

get_plugins_root()

load(*name*)
Loads given plugin

load_all()

load_recursive(*name*)

register_implementation(*impl*)

register_interface(*iface*)

resolve_path(*name*)

3.9 ajenti.profiler

ajenti.profiler.**get_profiles**()
Returns all accumulated profiling values

ajenti.profiler.**profile_end**(*name=None*)
Ends a profiling interval with specific `name`

ajenti.profiler.**profile_start**(*name*)
Starts a profiling interval with specific `name` Profiling data is sent to the client with next data batch.

ajenti.profiler.**profiled**(*namefx=None*)

3.10 ajenti.ui

class ajenti.ui.**UI**
The root UI object, one per session

clear_updates()
Marks all pending updates as processed

create(*typeid*, **args*, ***kwargs*)
Creates an element by its type ID.

Parameters **typeid** (*str*) – type ID

dispatch_event(*uid*, *event*, *params=None*)
Dispatches an event to an element with given UID

Parameters

- **uid** (*int*) – element UID
- **event** (*str*) – event name
- **params** (*dict, None*) – event arguments

find(*id*)

Parameters **id** (*str*) – element ID

Returns nearest element with given ID

Return type UIElement, None

find_uid(*uid*)

Parameters **uid** (*int*) – element UID

Returns nearest element with given unique ID

Return type UIElement, None

has_updates()
Checks for pending UI updates

Return type bool

inflate(*layout*)

Parameters **layout** (*str*) – layout spec: "<plugin id>:<layout file name without extension>"

Returns an inflated element tree of the given layout XML name

Return type *UIElement*

init()

render()
Renders the UI into JSON

Return type dict

class ajenti.ui.**UIElement**(*ui*, *typeid=None*, *children=[]*, ***kwargs*)
Base UI element class

append(*child*)
Appends a `child`

Parameters **child** (*UIElement*) – child

bind
Bound property name

bindtransform
Value transformation function for one-direction bindings

broadcast(*method*, **args*, ***kwargs*)
Calls `method` on every member of the subtree

Parameters **method** (*str*) – method

clear_updates()
Marks all pending updates as processed

client
Whether this element's events are only processed on client side

clone(*set_ui=None*, *set_context=None*)

Returns a deep copy of the element and its children. Property values are shallow copies.

Return type *UIElement*

contains(*element*)
Checks if the `element` is in the subtree of `self`

Parameters **element** (*UIElement*) – element

delete()
Detaches this element from its parent

dispatch_event(*uid*, *event*, *params=None*)
Dispatches an event to an element with given UID

Parameters

- **uid** (*int*) – element UID
- **event** (*str*) – event name

- **params** (*dict, None*) – event arguments

empty()
Detaches all child elements

event(*event*, *params=None*)
Invokes handler for `event` on this element with given `**params`

Parameters

- **event** (*str*) – event name
- **params** (*dict, None*) – event arguments

find(*id*)

Parameters **id** (*str*) – element ID

Returns the nearest child with given ID or `None`

Return type *UIElement*, None

find_type(*typeid*)

Returns the nearest child with given type ID or `None`

Return type *UIElement*, None

find_uid(*uid*)

Parameters **uid** (*int*) – element UID

Returns the nearest child with given UID or `None`

Return type *UIElement*, None

has_updates()
Checks for pending UI updates

id
Element ID

init()

invalidate()

nearest(*predicate*, *exclude=None*, *descend=True*)
Returns the nearest child which matches an arbitrary predicate lambda

Parameters

- **predicate** (*function*) – `lambda element: bool`
- **exclude** (*function, None*) – `lambda element: bool` - excludes matching branches from search
- **descend** (*bool*) – whether to descend inside matching elements

on(*event*, *handler*, **args*)
Binds event with ID `event` to `handler`. `*args` will be passed to the `handler`. :param event: event :type event: str :param handler: handler :type handler: function

path_to(*element*)

Returns a list of elements forming a path from `self` to `element`

Return type list

post_clone()

property_definitions

remove (*child*)
Detaches the `child`

Parameters **child** (*UIElement*) – child

render ()
Renders this element and its subtree to JSON

Return type dict

reverse_event (*event*, *params=None*)
Raises the event on this element by feeding it to the UI root (so that `@on` methods in ancestors will work).

Parameters

- **event** (*str*) – event name
- **params** (*dict*) – event arguments

style
Additional CSS class

typeid = None

visible
Visibility of the element

ajenti.ui.**p** (*prop*, *default=None*, *bindtypes=[]*, *type=<type 'unicode'>*, *public=True*, *doc=None*)
Creates an UI property inside an *UIElement*:

```
@p('title')
@p('category', default='Other', doc='Section category name')
@p('active', default=False)
class SectionPlugin (BasePlugin, UIElement):
    typeid = 'main:section'
```

Parameters

- **default** (*object*) – Default value
- **bindtypes** (*list*) – List of Python types that can be bound to this property
- **type** (*object*) – expected Python type for this value
- **public** (*bool*) – whether this property is rendered and sent to client
- **doc** (*str, None*) – docstring

Return type function

ajenti.ui.**on** (*id*, *event*)
Sets the decorated method to handle indicated event:

```
@plugin
class Hosts (SectionPlugin):
    def init(self):
        self.append(self.ui.inflate('hosts:main'))
        ...

    @on('save', 'click')
    def save(self):
        self.config.save()
```

Parameters

- **id** (*str*) – element ID
- **event** (*str*) – event name

Return type function

3.11 ajenti.ui.binder

class ajenti.ui.binder.**Binding**(*object*, *attribute*, *ui*)
A base class for bindings. Binding is a link between a Python object attribute and Ajenti UI element's property.

Parameters

- **object** – a Python object
- **attribute** – attribute name
- **ui** – Ajenti *ajenti.ui.UIElement*

classmethod applicable(*object*, *attribute*)

classmethod extract(*object*, *attribute*, *ignore_errors=True*)

get()

Returns value of the bound attribute

populate()
Should update the UI with attribute's value

set(*value*)
Sets value of the bound attribute

unpopulate()
Should revert UI to normal state

update()
Should update the attribute with data from the UI

class ajenti.ui.binder.**PropertyBinding**(*obj*, *attribute*, *ui*, *property=None*)
A simple binding between UI element's property and Python object's attribute

Parameters **property** – UI property name. If `None`, property is deduced from `bindtypes`

populate()

update()

class ajenti.ui.binder.**ListAutoBinding**(*object*, *attribute*, *ui*)
Binds values of a collection to UI element's children consecutively, using *Binder*

populate()

unpopulate()

update()

class ajenti.ui.binder.**DictAutoBinding**(*object*, *attribute*, *ui*)
Binds values from a dict to UI element's children mapping 'bind' attribute to dict key, using *Binder*

populate()

unpopulate()

update()

class ajenti.ui.binder.**CollectionAutoBinding**(*object*, *attribute*, *ui*)
Binds values of a collection to UI element's children using a template. The expected UI layout:

```
<xml xmlns:bind="bind">
    <bind:collection id="<binding to this>">
        <container-element bind="__items">
            <1-- instantiated templates will appear here -->
        </container-element>

        <bind:template>
            <!-- a template for one collection item
                 it will be bound to item using ajenti.ui.binder.Binder -->
            <label bind="some_property" />

            <button id="__delete" /> <!-- a delete button may appear in the template -->
        </bind:template>

        <button id="__add" /> <!-- an add button may appear inside collection tag -->
    </bind:collection>
</xml>
```

get_template(*item*, *ui*)

on_add()

on_delete(*item*)

populate()

set_page(*page=0*)

unpopulate()

update()

class ajenti.ui.binder.**Binder**(*object=None*, *ui=None*)
An automatic object-to-ui-hierarchy binder. Uses `bind` UI property to find what and where to bind. If `object` is not None, the Binder is also initialized (see `setup(object)`) with this data object.

Parameters

- **object** – Python object
- **ui** – UI hierarchy root

add(*binding*)

autodiscover(*object=None*, *ui=None*)

populate()
Populates the bindings.

reset(*object=None*, *ui=None*)
Cancels the binding and replaces Python object / UI root.

setup(*object=None*)
Initializes the Binder with a data object. :type object: object

unpopulate()
Unpopulates the bindings.

update()
Updates the bindings.

class ajenti.ui.binder.**BasicCollectionElement**(*ui*, *typeid=None*, *children=[]*, ***kwargs*)

binding
Collection binding class to use

filter
Called to filter collections values, `lambda value: bool`

post_bind
Called after binding is complete, `lambda object, collection, ui: None`

post_item_bind
Called after an item is bound, `lambda object, collection, item, item-ui: None`

post_item_update
Called after an item is updated, `lambda object, collection, item, item-ui: None`

values
Called to extract values from the collection, `lambda collection: []`

class ajenti.ui.binder.**ListElement**(*ui*, *typeid=None*, *children=[]*, ***kwargs*)

typeid = 'bind:list'

class ajenti.ui.binder.**CollectionElement**(*ui*, *typeid=None*, *children=[]*, ***kwargs*)

add_item
Called to append value to the collection, `lambda item, collection: None`

delete_item
Called to remove value from the collection, `lambda item, collection: None`

new_item
Called to create an empty new item, `lambda collection: object()`

pagesize

sorting
If defined, used as key function to sort items

typeid = 'bind:collection'

3.12 ajenti.users

ajenti.users.**restrict**(*permission*)
Marks a decorated function as requiring `permission`. If the invoking user doesn't have one, *SecurityError* is raised.

class ajenti.users.**PermissionProvider**
Override to create your own set of permissions

get_name()
Should return a human-friendly name for this set of permissions (displayed in Configurator) :rtype: str

get_permissions()
Should return a list of permission names

Return type list

exception ajenti.users.**SecurityError**(*permission*)
Indicates that user didn't have a required permission.

permission
permission ID

class ajenti.users.**UserManager**

check_password(*username*, *password*, *env=None*)
Verifies the given username/password combo

Return type bool

classconfig_root = True

default_classconfig = {'sync-provider': ''}

get_sync_provider(*fallback=False*)

Return type ajenti.usersync.UserSyncProvider

has_permission(*context*, *permission*)
Checks whether the current user has a permission

Return type bool

hash_password(*password*)

Return type str

hash_passwords()

require_permission(*context*, *permission*)
Checks current user for given permission and raises *SecurityError* if he doesn't have one :type permission: str :raises: SecurityError

set_password(*username*, *password*)

set_sync_provider(*provider_id*)

3.13 ajenti.util

ajenti.util.**public**(*f*)
" Use a decorator to avoid retyping function/class names.

Based on an idea by Duncan Booth: http://groups.google.com/group/comp.lang.python/msg/11cbb03e09611b8a

Improved via a suggestion by Dave Angel: http://groups.google.com/group/comp.lang.python/msg/3d400fb22d8a42e1

ajenti.util.**str_fsize**(*sz*)
Formats file size as string (i.e., 1.2 Mb)

ajenti.util.**str_timedelta**(*s*)
Formats a time delta (i.e., "5 days, 5:06:07")

ajenti.util.**cache_value**(*duration=None*)
Makes a function lazy.

Parameters **duration** (*int*) – cache duration in seconds (default: infinite)

ajenti.util.**platform_select**(***values*)

Selects a value from **kwargs** depending on runtime platform

```
    service = platform_select(
        debian='samba',
        ubuntu='smbd',
        centos='smbd',
        default='samba',
    )
```

ajenti.util.**make_report**(*e*)

Formats a bug report.

CHAPTER 4

Plugin API Reference

4.1 ajenti.plugins.main.api

4.2 ajenti.plugins.dashboard.api

class ajenti.plugins.dashboard.api.**ConfigurableWidget**(*ui*, *typeid=None*, *children=[]*, ***kwargs*)

Base class for widgets with a configuration dialog

begin_configuration()

create_config()
Should return a default config dict

init()

on_config(*button*)

on_config_save()
Called when user is done configuring the widget.

on_config_start()
Called when user begins to configure the widget. Should populate the config dialog.

on_prepare()
Widget should create its UI in this method. Called before **self.config** is created

on_start()
Widget should populate its UI in this method. **self.config** is now available.

class ajenti.plugins.dashboard.api.**DashboardWidget**(*ui*, *typeid=None*, *children=[]*, ***kwargs*)

Base class for widgets (inherits *ajenti.ui.UIElement*).

config
current configuration dict of this widget instance

configurable

container

hidden = False
If True, user will not be able to add this widget through dashboard

icon = None
Widget icon name

index

name = '—'
Widget type name

save_config()

typeid = 'dashboard:widget'

4.3 ajenti.plugins.configurator.api

class ajenti.plugins.configurator.api.**ClassConfigEditor**(*ui*, *typeid=None*, *children=[]*, ***kwargs*)

title

typeid = 'configurator:classconfig-editor'

4.4 ajenti.plugins.db_common.api

4.5 ajenti.plugins.webserver_common.api

4.6 ajenti.plugins.packages.api

class ajenti.plugins.packages.api.**PackageInfo**

class ajenti.plugins.packages.api.**PackageManager**

do(*actions*, *callback=<function <lambda>>*)

get_lists()

init()

refresh()

search(*query*)

4.7 ajenti.plugins.services.api

class ajenti.plugins.services.api.**Service**

command(*cmd*)

icon

restart()

source = 'unknown'
Marks which ServiceManager owns this object

start()

stop()

class ajenti.plugins.services.api.**ServiceManager**

get_one(*name*)
Returns a *Service* by name.

class ajenti.plugins.services.api.**ServiceMultiplexor**
Merges together output of all available ServiceManagers.

get_all(**args*, ***kwargs*)
Returns all *Service* s.

get_one(*name*)
Returns a *Service* by name.

init()

4.8 ajenti.plugins.tasks.api

class ajenti.plugins.tasks.api.**JobDefinition**(*j={}*)

save()

class ajenti.plugins.tasks.api.**Task**(***kwargs*)
Base class for custom tasks

Parameters

- **name** – display name
- **ui** – full layout name for parameter editor, will be bound to parameter dictionary (so begin it with <bind:dict bind="params">)
- **hidden** – if True, task won't be available for manual creation

abort()

get_progress()

hidden = False

init()

name = '—'

run(***kwargs*)
Override with your task actions here. Raise *TaskError* in case of emergency. Check *aborted* often and return if it's True

set_progress(*current*, *max*)

start()

ui = None

class ajenti.plugins.tasks.api.**TaskDefinition**(*j={}*, *task_class=None*)

get_class()

save()

exception ajenti.plugins.tasks.api.**TaskError**

class ajenti.plugins.tasks.api.**TaskResult**

ABORTED = 1

CRASH = 3

ERROR = 2

SUCCESS = 0

CHAPTER 5

Indices and tables

- genindex
- modindex
- search

a

Symbols

A

B

C

D

E

F

G

H

I

J

L

M

N

O

P

R

S

T

U

V