# outgoing Release 0.2.0

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# **CONTENTS**

1	Configuration  1.1 The Configuration File	3
	1.2       Sending Methods          1.3       Passwords	3 6
2	Core Python API 2.1 Functions	9 10 10
3	Command-Line Program 3.1 Options	<b>13</b>
4	Available Extensions 4.1 Sending Methods	15 15 15
5	Writing Extensions 5.1 Writing Sending Methods	17 17 18
6	Utilities for Extension Authors 6.1 Pydantic Types & Models	<b>19</b> 20
7	Changelog         7.1       v0.2.0 (2021-03-14)          7.2       v0.1.0 (2021-03-06)	23 23 23
8	Installation	25
9	Examples	27
10	Indices and tables	29
Pyt	thon Module Index	31
Inc	lex	33

GitHub | PyPI | Documentation | Issues | Changelog

CONTENTS 1

2 CONTENTS

ONE

## CONFIGURATION

## 1.1 The Configuration File

outgoing reads information on what sending method and parameters to use from a TOML or JSON configuration file. The default configuration file is TOML, and its location depends on your OS:

Linux	~/.local/share/outgoing/outgoing.toml or \$XDG_DATA_HOME/outgoing/		
	outgoing.toml		
macOS	~/Library/Application Support/outgoing/outgoing.toml		
Win-	C:\Users\ <username>\AppData\Local\jwodder\outgoing\outgoing.toml</username>		
dows			

To find the exact path on your system, after installing outgoing, run:

Within the configuration file, all of the outgoing settings are contained within a table named "outgoing". This table must include at least a method key giving the name of the sending method to use. The rest of the table depends on the method chosen (see below). Unknown or inapplicable keys in the table are ignored.

File & directory paths in the configuration file may start with a tilde ( $\sim$ ) to refer to a path in the user's home directory. Any relative paths are resolved relative to the directory containing the configuration file.

## 1.2 Sending Methods

## 1.2.1 command

The command method sends an e-mail by passing it as input to a command (e.g., sendmail, sold separately).

Configuration fields:

**command** [string or list of strings (optional)] Specify the command to run to send e-mail. This can be either a single command string that will be interpreted by the shell or a list of command arguments that will be executed directly without any shell processing. The default command is sendmail -i -t.

**Note:** Relative paths in the command will not be resolved by outgoing (unlike other paths in the configuration file), as it is not possible to reliably determine what is a path and what is not.

Example command configuration:

```
[outgoing]
method = "command"
command = ["/usr/local/bin/mysendmail", "-i", "-t"]
```

Another sample configuration:

```
[outgoing]
method = "command"
# A single string will be interpreted by the shell, so metacharacters like
# pipes have their special meanings:
command = "my-mail-munger | ~/some/dir/mysendmail"
```

## 1.2.2 smtp

The smtp method sends an e-mail to a server over SMTP.

Configuration fields:

host [string (required)] The domain name or IP address of the server to connect to

```
ssl [boolean or "starttls" (optional)]
```

- true: Use SSL/TLS from the start of the connection
- false (default): Don't use SSL/TLS
- "starttls": After connecting, switch to SSL/TLS with the STARTTLS command

port [integer (optional)] The port on the server to connect to; the default depends on the value of ssl:

- true 465
- false 25
- "starttls" 587

username [string (optional)] Username to log into the server with

**password** [password (optional)] Password to log into the server with; can be given as either a string or a password specifier (see "Passwords")

netrc [boolean or filepath (optional)] If true, read the username & password from ~/.netrc instead of specifying them in the configuration file. If a filepath, read the credentials from the given netrc file. If false, do not
use a netrc file.

Example smtp configuration:

```
[outgoing]
method = "smtp"
host = "mx.example.com"
ssl = "starttls"
username = "myname"
password = { "file" = "~/secrets/smtp-password" }
```

Another sample configuration:

```
[outgoing]
method = "smtp"
host = "mail.nil"
```

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```
port = 1337
ssl = true
# Read username & password from the "mail.nil" entry in this netrc file:
netrc = "~/secrets/net.rc"
```

## 1.2.3 mbox

The mbox method appends e-mails to an mbox file on the local machine.

Configuration fields:

**path** [filepath (required)] The location of the mbox file. If the file does not exist, it will be created when the sender object is entered.

Example mbox configuration:

```
[outgoing]
method = "mbox"
path = "~/MAIL/inbox"
```

#### 1.2.4 maildir

The maildir method adds e-mails to a Maildir mailbox directory on the local machine.

Configuration fields:

**path** [directory path (required)] The location of the Maildir mailbox. If the directory does not exist, it will be created when the sender object is entered.

folder [string (optional)] A folder within the Maildir mailbox in which to place e-mails

### 1.2.5 mh

The mh method adds e-mails to an MH mailbox directory on the local machine.

Configuration fields:

**path** [directory path (required)] The location of the MH mailbox. If the directory does not exist, it will be created when the sender object is entered.

**folder** [string or list of strings (optional)] A folder within the Maildir mailbox in which to place e-mails; can be either the name of a single folder or a path through nested folders & subfolders

Example configuration:

```
[outgoing]
method = "mh"
path = "~/mail"
# Place e-mails inside the "work" folder inside the "important" folder:
folder = ["important", "work"]
```

## 1.2.6 mmdf

The mmdf method adds e-mails to an MMDF mailbox file on the local machine.

Configuration fields:

**path** [filepath (required)] The location of the MMDF mailbox. If the file does not exist, it will be created when the sender object is entered.

## 1.2.7 baby1

The babyl method adds e-mails to a Babyl mailbox file on the local machine.

Configuration fields:

path [filepath (required)] The location of the Babyl mailbox. If the file does not exist, it will be created when the sender object is entered.

#### 1.2.8 null

Goes nowhere, does nothing, ignores all configuration keys.

Example null configuration:

```
[outgoing]
# Just send my e-mails into a black hole
method = "null"
```

## 1.3 Passwords

When a sending method calls for a password, API key, or other secret, there are several ways to specify the value.

Using a string, naturally, supplies the value of that string as the password:

```
password = "hunter2"
```

Alternatively, passwords may instead be looked up in external resources. This is done by setting the value of the password field to a table with a single key-value pair, where the key identifies the password lookup scheme and the value is either a string or a sub-table, depending on the scheme.

The builtin password schemes are as follows. Extension packages can define additional password schemes.

## 1.3.1 base 64

For slightly more security than a plaintext password, a password can be stored in base64 by specifying a table with a single base64 key and the encoded password as the value:

```
password = { base64 = "aHVudGVyMg==" }
```

Base64 passwords must decode to UTF-8 text.

## 1.3.2 file

A password can be read from a file by specifying a table with a single file key and the filepath as the value:

```
password = { file = "path/to/file" }
```

The entire contents of the file, minus any leading or trailing whitespace, will then be used as the password. As with paths elsewhere in the configuration file, the path may start with a tilde, and relative paths are resolved relative to the directory containing the configuration file.

## 1.3.3 env

A password can be read from an environment variable by specifying a table with a single env key and the name of the environment variable as the value:

```
password = { env = "PROTOCOL_PASSWORD" }
```

#### 1.3.4 dotenv

Passwords can be read from a key in a .env-style file as supported by python-dotenv like so:

```
password = { dotenv = { key = "NAME_OF_KEY_IN_FILE", file = "path/to/file" } }
```

The file path is resolved following the same rules as other paths. If the file field is omitted, the given key will be looked up in a file named .env in the same directory as the configuration file.

## 1.3.5 keyring

Passwords can be retrieved from the system keyring using keyring. The basic format is:

```
password = { keyring = { service = "host_or_service_name", username = "your_username",
     } }
```

If the service key is omitted, the value will default to the sending method's host value, if it has one; likewise, an omitted username will default to the username for the sending method, if there is one. A specific keyring backend can be specified with the backend key, and the directory from which to load the backend can be specified with the keyring-path key.

1.3. Passwords 7

**TWO** 

## **CORE PYTHON API**

## 2.1 Functions

outgoing provides the following functions for constructing e-mail sender objects. Once you have a sender object, simply use it in a context manager to open it up, and then call its send() method with each email.message. EmailMessage object you want to send. See *Examples* for examples.

```
outgoing.from_config_file (path: Optional[Union[str, bytes, os.PathLike[str], os.PathLike[bytes]]] = None, section: Optional[str] = 'outgoing', fallback: bool = True) \rightarrow outgoing.core.Sender
```

Read configuration from the table/field section (default "outgoing") in the file at path (default: the path returned by  $get\_default\_configpath()$ ) and construct a sender object from the specification. The file may be either TOML or JSON (type detected based on file extension). If section is None, the entire file, rather than only a single field, is used as the configuration. If fallback is true, the file is not the default config file, and the file either does not exist or does not contain the given section, fall back to reading from the default section of the default config file.

#### Raises

- InvalidConfigError if the configuration is invalid
- MissingConfigError if no configuration file or section is present

```
outgoing.from_dict (data: Mapping[str, Any], configpath: Optional[Union[str, bytes, os.PathLike[str], os.PathLike[bytes]]] = None) \rightarrow outgoing.core.Sender
```

Construct a sender object using the given data as the configuration. If configpath is given, any paths in the data will be resolved relative to configpath's parent directory; otherwise, they will be resolved relative to the current directory.

data should not contain a "configpath" key; such an entry will be discarded.

**Raises** *InvalidConfigError* – if the configuration is invalid

```
outgoing.get_default_configpath() → pathlib.Path
```

Returns the location of the default config file (regardless of whether it exists) as a pathlib.Path object

## 2.2 Sender Objects

```
class outgoing.Sender
```

Sender is a Protocol implemented by sender objects. The protocol requires the following behavior:

- Sender objects can be used as context managers, and their \_\_enter\_\_ methods return self.
- Within its own context, calling a sender's send(msg: email.message.EmailMessage) method sends the given e-mail.

```
\underline{\hspace{0.5cm}}enter\underline{\hspace{0.5cm}}() \to S
```

\_\_exit\_\_ (exc\_type: Optional[Type[BaseException]], exc\_val: Optional[BaseException], exc\_tb: Optional[traceback]) → Optional[bool]

**send** ( $msg: email.message.EmailMessage) \rightarrow Any$ 

Send msg or raise an exception if that's not possible

Raised when no configuration section can be found in any config files

In addition to the base protocol, outgoing's built-in senders are reentrant and reusable as context managers, and their send() methods can be called outside of a context.

## 2.3 Exceptions

```
exception outgoing.errors.Error
     Bases: Exception
     The superclass for all exceptions raised by outgoing
exception outgoing.errors.InvalidConfigError(details:
                                                                          configpath:
                                                                                         Op-
                                                                   str,
                                                        tional[Union[str, bytes, os.PathLike[str],
                                                        os.PathLike[bytes]]] = None)
     Bases: outgoing.errors.Error
     Raised on encountering an invalid configuration structure
     configpath: Optional[Union[str, bytes, os.PathLike[str], os.PathLike[bytes]]]
         The path to the config file containing the invalid configuration
     details: str
         A message about the error
exception outgoing.errors.InvalidPasswordError(details:
                                                                                   configpath:
                                                          Optional[Union[str,
                                                                                       bytes.
                                                          os.PathLike[str], os.PathLike[bytes]]] =
                                                          None)
     Bases: outgoing.errors.InvalidConfigError
     Raised on encountering an invalid password specifier or when no password can be determined from a specifier
     configpath: Optional[Union[str, bytes, os.PathLike[str], os.PathLike[bytes]]]
         The path to the config file containing the invalid configuration
     details: str
         A message about the error
exception outgoing.errors.MissingConfigError(configpaths: Sequence[Union[str, bytes,
                                                        os.PathLike[str], os.PathLike[bytes]]])
     Bases: outgoing.errors.Error
```

configpaths: List[Union[str, bytes, os.PathLike[str], os.PathLike[bytes]]]
 Paths to the configfiles searched for configuration

## exception outgoing.errors.NetrcLookupError

Bases: outgoing.errors.Error

Raised by <code>lookup\_netrc()</code> on failure to find a match in a netrc file

## exception outgoing.errors.UnsupportedEmailError

Bases: outgoing.errors.Error

Raised by sender objects when asked to send an e-mail that uses features or constructs that the sending method does not support

2.3. Exceptions

## **COMMAND-LINE PROGRAM**

```
outgoing [<options>] [<msg-file> ...]
```

You can use outgoing to send fully-composed e-mails directly from the command line with the **outgoing** command. Save your e-mail as a complete <code>message/rfc822</code> document and then run outgoing <code>path/to/email/file</code> to send it using the configuration in the default config file (or specify another config file with the <code>--config</code> option). Multiple files can be passed to the command at once to send multiple e-mails. If no files are specified on the command line, the command reads an e-mail from standard input.

## 3.1 Options

- -c <file>, --config <file>
   Specify a configuration file to use instead of the default configuration file
- -E <file>, --env <file>
  New in version 0.2.0.

Load environment variables from the given .env file before reading the configuration file. By default, environment variables are loaded from the first file named ".env" found by searching from the current directory upwards.

-1 <level>, --log-level <level> New in version 0.2.0.

Set the logging level to the given value; default: INFO. The level can be given as a case-insensitive level name or as a numeric value.

-s <key>, --section <key> New in version 0.2.0.

Read the configuration from the given table or key in the configuration file; defaults to "outgoing"

#### --no-section

New in version 0.2.0.

Read the configuration fields from the top level of the configuration file instead of expecting them to all be contained below a certain table/key

**FOUR** 

## **AVAILABLE EXTENSIONS**

It is possible to write packages for extending outgoing with support for further sending methods and password schemes. See *Writing Extensions* for how to do so.

If you develop an extension package, please submit a PR so it can be listed on this page!

# 4.1 Sending Methods

• outgoing-mailgun — Supports sending e-mail via Mailgun

## 4.2 Password Schemes

None yet. Be the first!

**FIVE** 

## WRITING EXTENSIONS

## **5.1 Writing Sending Methods**

A sending method is implemented as a callable (usually a class) that accepts the fields of a configuration structure as keyword arguments and returns a *sender object*. The keyword arguments include the method field and also include a confignath key specifying a pathlib.Path pointing to the configuration file (or None if from\_dict() was called without setting a confignath). Callables should accept any keyword argument and ignore any that they do not recognize.

For example, given the following configuration:

```
[outgoing]
method = "foobar"
server = "www.example.nil"
password = { env = "SECRET_TOKEN" }
comment = "I like e-mail!"
```

the callable registered for the "foobar" method will be called with the following keyword arguments:

```
**{
    "method": "foobar",
    "server": "www.example.nil",
    "password": {"env": "SECRET_TOKEN"},
    "comment": "I like e-mail!",
    "configpath": Path("path/to/configfile"),
}
```

If the configuration passed to a callable is invalid, the callable should raise an InvalidConfigError.

Callables can resolve password fields by passing them to <code>resolve\_password()</code> or by using pydantic and the <code>Password</code> type. Callables should resolve paths relative to the directory containing <code>configpath</code> by using <code>resolve\_path()</code> or by using pydantic and the <code>Path</code>, <code>FilePath</code>, and/or <code>DirectoryPath</code> types.

The last step of writing a sending method is to package it in a Python project and declare the callable as an entry point in the outgoing.senders entry point group so that users can install & access it. For example, if your project is built using setuptools, and the callable is a FooSender class in the foobar.senders module, and you want it to be usable by setting method = "foo", add the following to your setup.py:

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```
},
...
```

## 5.2 Writing Password Schemes

A password scheme is implemented as a function that takes the value part of a password = { scheme = value } entry as an argument and returns the corresponding password as a str. If the function additionally accepts arguments named host, username, and/or configpath (either explicitly or via \*\*kwargs), the corresponding values passed to resolve\_password() will be forwarded to the scheme function.

If the value structure is invalid, or if no password can be found, the function should raise an InvalidPasswordError.

The last step of writing a password scheme is to package it in a Python project and declare the function as an entry point in the outgoing.password\_schemes entry point group so that users can install & access it. For example, if your project is built using setuptools, and the function is foo\_scheme() in the foobar.passwords module, and you want it to be usable by writing password = { foo = some-value }, add the following to your setup.py:

## **UTILITIES FOR EXTENSION AUTHORS**

outgoing.lookup\_netrc (host: str, username: Optional[str] = None, path: Optional[Union[str, bytes, os.PathLike[str], os.PathLike[bytes]]] = None)  $\rightarrow$  Tuple[str, str]

Look up the entry for host in the netrc file at path (default: ~/.netrc) and return a pair of the username & password. If username is specified and it does not equal the username in the file, a NetrcLookupError is raised.

#### Raises

- **NetrcLookupError** if no entry for host or the default entry is present in the netro file; or if username differs from the username in the netro file
- netrc.NetrcParseError if the netrc module encounters an error

outgoing.resolve\_password (password: Union[str, Mapping[str, Any]], host: Optional[str] = None, username: Optional[str] = None, configpath: Optional[Union[str, pathlib.Path]] = None)  $\rightarrow$  str

Resolve a configuration password value. If password is a string, it is returned unchanged. Otherwise, it must be a mapping with exactly one element; the key is used as the name of the password scheme, and the value is passed to the corresponding function for retrieving the password.

When resolving a password field in an outgoing configuration structure, the configuration any host/service or username values from the configuration (or host/service/username constants specific to the sending method) should be passed into this function so that they can be made available to any password scheme functions that need them.

Raises InvalidPasswordError - if password is invalid or cannot be resolved

outgoing.resolve\_path (path: Union[str, bytes, os.PathLike[str], os.PathLike[bytes]], basepath: Optional[Union[str, bytes, os.PathLike[str], os.PathLike[bytes]]] = None)  $\rightarrow$  pathlib.Path

Convert a path to a pathlib.Path instance and resolve it using the same rules for as paths in outgoing configuration files: expand tildes by calling Path.expanduser(), prepend the parent directory of basepath (usually the value of configpath) to the path if given, and then resolve the resulting path to make it absolute.

#### **Parameters**

- path (path) the path to resolve
- basepath (path) an optional path to resolve path relative to

Return type pathlib.Path

#### class outgoing.OpenClosable

Bases: abc.ABC, pydantic.main.BaseModel

An abstract base class for creating reentrant context managers. A concrete subclass must define open() and close() methods; <code>OpenClosable</code> will then define <code>\_\_enter\_\_</code> and <code>\_\_exit\_\_</code> methods that keep track

of the depth of nested with statements, calling open() and close() only when entering & exiting the outermost with.

```
abstract close() \rightarrow None abstract open() \rightarrow None
```

## 6.1 Pydantic Types & Models

The senders built into outgoing make heavy use of pydantic for validating & processing configuration, and some of the custom types & models used are also of general interest to anyone writing an outgoing extension that also uses pydantic.

#### class outgoing.Path

Converts its input to pathlib.Path instances, including expanding tildes. If there is a field named configpath declared before the *Path* field and its value is non-None, then the value of the *Path* field will be resolved relative to the parent directory of the configpath field; otherwise, it will be resolved relative to the current directory.

#### class outgoing.FilePath

Like Path, but the path must exist and be a file

#### class outgoing.DirectoryPath

Like Path, but the path must exist and be a directory

#### class outgoing.Password

A subclass of pydantic.SecretStr that accepts outgoing password specifiers as input and automatically resolves them using resolve\_password(). Host, username, and configpath values are passed to resolve\_password() as follows:

- If Password is subclassed and given a host class variable naming a field, and if the subclass is then used in a model where a field with that name is declared before the Password subclass field, then when the model is instantiated, the value of the named field will be passed as the host argument to resolve\_password(). (If the named field is not present on the model that uses the subclass, the Password field will fail validation.)
- Alternatively, <code>Password</code> can be subclassed with host set to a class callable (a classmethod or staticmethod), and when that subclass is used in a model being instantiated, the callable will be passed a dict of all validated fields declared before the password field; the return value from the callable will then be passed as the host argument to <code>resolve\_password()</code>. (If the callable raises an exception, the <code>Password</code> field will fail validation.)
- If Password is used in a model without being subclassed, or if host is not defined in a subclass, then None will be passed as the host argument to resolve\_password().
- The username argument to resolve\_password() can likewise be defined by subclassing Password and defining username appropriately.
- If there is a field named configpath declared before the *Password* field, then the value of configpath is passed to *resolve\_password()*.

For example, if writing a pydantic model for a sender configuration where the host-analogue value is passed in a field named "service" and for which the username is always "\_\_token\_\_", you would subclass Password like this:

```
class MyPassword(outgoing.Password):
   host = "service"
```

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```
@staticmethod
def username(values: Dict[str, Any]) -> str:
    return "__token__"
```

and then use it in your model like so:

```
class MySender(pydantic.BaseModel):
    configpath: Optional[outgoing.Path]
    service: str
    password: MyPassword # Must come after `configpath` and `service`!
    # ... other fields ...
```

Then, when MySender is instantiated, the input to the password field would be automatically resolved by doing (effectively):

```
my_sender.password = pydantic.SecretStr(
    resolve_password(
        my_sender.password,
        host=my_sender.service,
        username="__token__",
        configpath=my_sender.configpath,
    )
)
```

**Note:** As this is a subclass of pydantic. SecretStr, the value of a *Password* field is retrieved by calling its get\_secret\_value() method.

#### class outgoing.StandardPassword

A subclass of Password in which host is set to "host" and username is set to "username"

## class outgoing.NetrcConfig

A pydantic model usable as a base class for any senders that wish to support both password fields and netro files. The model accepts the fields configpath, netro (a boolean or a file path; defaults to False), host (required), username (optional), and password (optional). When the model is instantiated, if password is None but netro is true or a filepath, the entry for host is looked up in ~/.netro or the given file, and the username and password fields are set to the values found.

The model will raise a validation error if any of the following are true:

- password is set but netrc is true
- password is set but username is not set
- username is set but password is not set and netro is false
- netro is true or a filepath, username is non-None, and the username in the netro file differs from username
- netro is true or a filepath and no entry can be found in the netro file

```
configpath: Optional[outgoing.config.Path]
host: str
netrc: Union[pydantic.types.StrictBool, outgoing.config.FilePath]
password: Optional[outgoing.config.StandardPassword]
username: Optional[str]
```

## **SEVEN**

## **CHANGELOG**

## 7.1 v0.2.0 (2021-03-14)

- Require the port field of SMTPSender to be non-negative
- Mark Sender as runtime\_checkable and export it
- Gave the **outgoing** command --section, --no-section, and --log-level options
- Added logging to built-in sender classes
- The outgoing command now loads settings from .env files and has an --env option

# 7.2 v0.1.0 (2021-03-06)

### Initial release

outgoing provides a common interface to multiple different e-mail sending methods (SMTP, sendmail, mbox, etc.). Just construct a sender from a configuration file or object, pass it an EmailMessage instance, and let the magical internet daemons take care of the rest.

outgoing itself provides support for only basic sending methods; additional methods are provided by *extension* packages.

**EIGHT** 

# **INSTALLATION**

outgoing requires Python 3.6 or higher. Just use pip for Python 3 (You have pip, right?) to install outgoing and its dependencies:

python3 -m pip install outgoing

**NINE** 

## **EXAMPLES**

A sample configuration file:

```
[outgoing]
method = "smtp"
host = "mx.example.com"
ssl = "starttls"
username = "myname"
password = { file = "~/secrets/smtp-password" }
```

Sending an e-mail based on a configuration file:

```
from email.message import EmailMessage
import outgoing
# Construct an EmailMessage object the standard Python way:
msg = EmailMessage()
msg["Subject"] = "Meet me"
msg["To"] = "my.beloved@love.love"
msg["From"] = "me@here.qq"
msg.set_content(
    "Oh my beloved!\n"
   "\n"
   "Wilt thou dine with me on the morrow?\n"
    "We're having hot pockets.\n"
    "\n"
    "Love, Me\n"
# Construct a sender object based on the default config file (assuming it's
# populated)
with outgoing.from_config_file() as sender:
    # Now send that letter!
    sender.send(msg)
```

As an alternative to using a configuration file, you can specify an explicit configuration by passing the configuration structure to the  $outgoing.from\_dict()$  method, like so:

```
from email.message import EmailMessage
import outgoing

# Construct an EmailMessage object using the eletter library
# <a href="https://github.com/jwodder/eletter">https://github.com/jwodder/eletter</a>:
from eletter import compose
```

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```
msg1 = compose(
  subject="No.",
   to=["me@here.qq"],
   from_="my.beloved@love.love",
   text=(
       "Hot pockets? Thou disgusteth me.\n"
        "Pineapple pizza or RIOT.\n"
   ),
)
msg2 = compose(
   subject="I'd like to place an order.",
   to=["pete@za.aa"],
   from_="my.beloved@love.love",
   text="I need the usual. Twelve Hawaiian Abominations to go, please.\n",
)
SENDING_CONFIG = {
    "method": "smtp",
    "host": "smtp.love.love",
    "username": "my.beloved",
    "password": {"env": "SMTP_PASSWORD"},
    "ssl": "starttls",
}
with outgoing.from_dict(SENDING_CONFIG) as sender:
   sender.send(msg1)
    sender.send(msg2)
```

# **TEN**

# **INDICES AND TABLES**

- genindex
- search

# **PYTHON MODULE INDEX**

0

outgoing, 1

32 Python Module Index

# **INDEX**

Symbols	F
enter() (outgoing.Sender method), 10	FilePath (class in outgoing), 20
exit() (outgoing.Sender method), 10	<pre>from_config_file() (in module outgoing), 9</pre>
-E <file></file>	<pre>from_dict() (in module outgoing), 9</pre>
outgoing command line option, 13	0
config <file></file>	G
outgoing command line option, 13	<pre>get_default_configpath() (in module outgo-</pre>
env <file></file>	ing), 9
outgoing command line option, 13	11
log-level <level></level>	Н
outgoing command line option, 13	host (outgoing.NetrcConfig attribute), 21
no-section	1
outgoing command line option, 13	I
section <key> outgoing command line option, 13</key>	InvalidConfigError, 10
-c <file></file>	InvalidPasswordError, 10
outgoing command line option, 13	1
-1 <level></level>	L
outgoing command line option, 13	lookup_netrc() (in module outgoing), 19
-s <key></key>	N.4
outgoing command line option, 13	M
	MissingConfigError, 10
C	module
close() (outgoing.OpenClosable method), 20	outgoing,1
configpath (outgoing.errors.InvalidConfigError at-	N
tribute), 10	• •
configpath (outgoing.errors.InvalidPasswordError	netrc (outgoing.NetrcConfig attribute), 21
attribute), 10	NetroConfig (class in outgoing), 21
configpath (outgoing.NetrcConfig attribute), 21	NetrcLookupError, 11
configpaths (outgoing.errors.MissingConfigError at-	0
tribute), 10	
D	open() (outgoing.OpenClosable method), 20 OpenClosable (class in outgoing), 19
	outgoing
details (outgoing.errors.InvalidConfigError at-	module, 1
tribute), 10	outgoing (command), 11
details (outgoing.errors.InvalidPasswordError	outgoing command line option
attribute), 10 DirectoryPath (class in outgoing), 20	-E <file>, 13</file>
Directory racii (class in omgoing), 20	config <file>,13</file>
E	env <file>, 13</file>
Error. 10	log-level <level>, 13</level>
Error, 10	

```
--section <key>, 13
    -c <file>, 13
    -1 <level>, 13
    -s < key>, 13
Р
Password (class in outgoing), 20
password (outgoing.NetrcConfig attribute), 21
Path (class in outgoing), 20
R
resolve_password() (in module outgoing), 19
resolve_path() (in module outgoing), 19
send() (outgoing.Sender method), 10
Sender (class in outgoing), 10
StandardPassword (class in outgoing), 21
U
UnsupportedEmailError, 11
username (outgoing.NetrcConfig attribute), 21
```

34 Index