Stefano Dottore
UNIMORE - 2020

easyshare

Command line application for transfer files between network hosts.
Like FTP, but (hopefully) easier.

What's easyshare

- A command line client-server application
  - Client: **es**
  - Server: **esd**

- **Handles** local and remote files
  (e.g. create directories, move files, remove files)

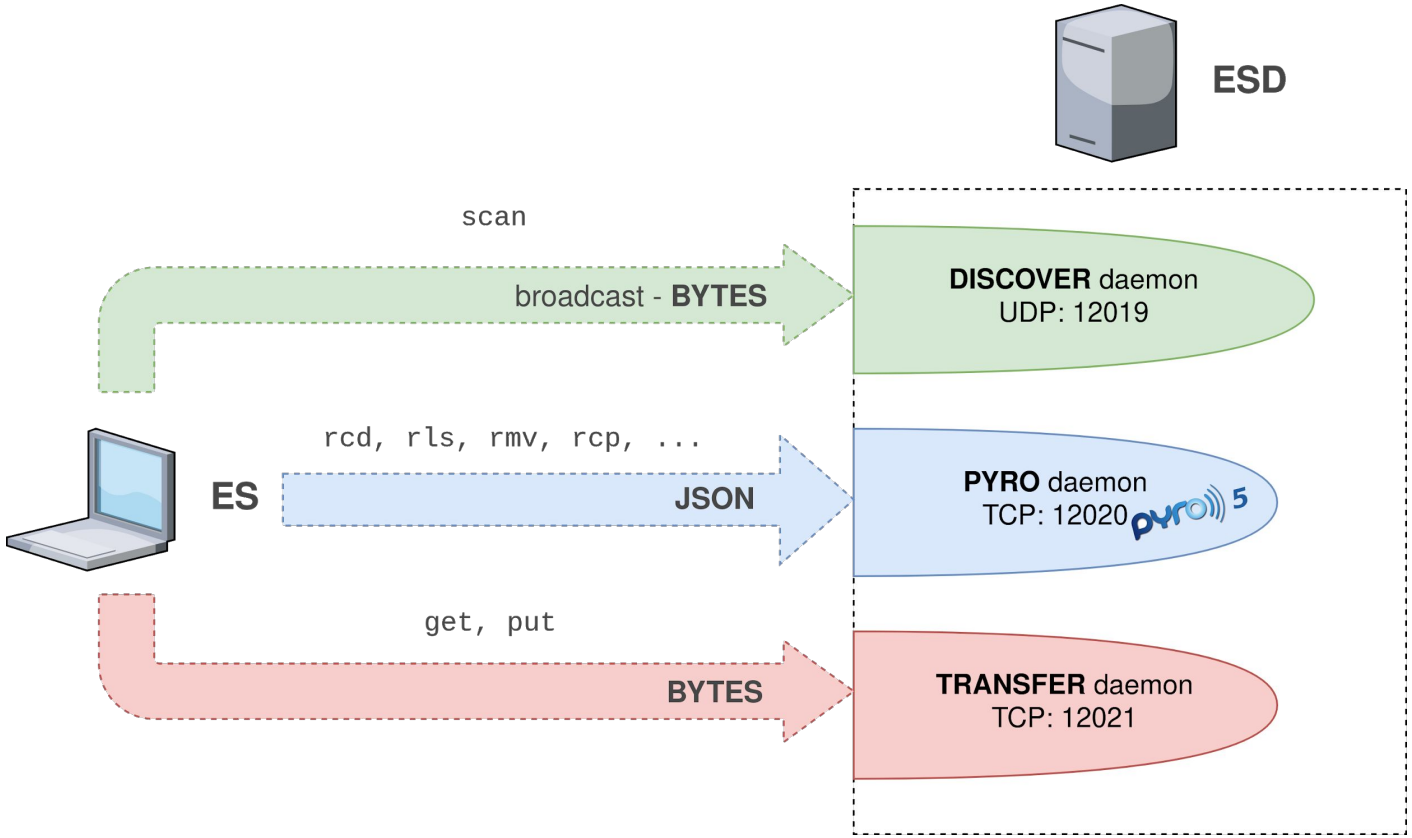
- **Transfers** files to and from remote hosts

- Automatically **discover** available *sharings* through **broadcast**

Technologies

- Written in *Python 3*
- Uses *Pyro 5* for high level operation
  A library that enables you to build applications in which objects can talk to each other over the network, with minimal programming effort. ***You can just use normal Python method calls to call objects running on other machines.*** *Pyro is a pure Python library and runs on many different platforms and Python versions.*
- Uses Python's *socket* for low level operation that need efficiency, such as file transfer

Network architecture



An overview: the commands

Local commands
pwd
ls
tree
cd
mkdir
cp
mv
rm
exec

Remote commands
rpwd
rls
rtree
rcd
rmkdir
rcp
rmv
rrm
rexec

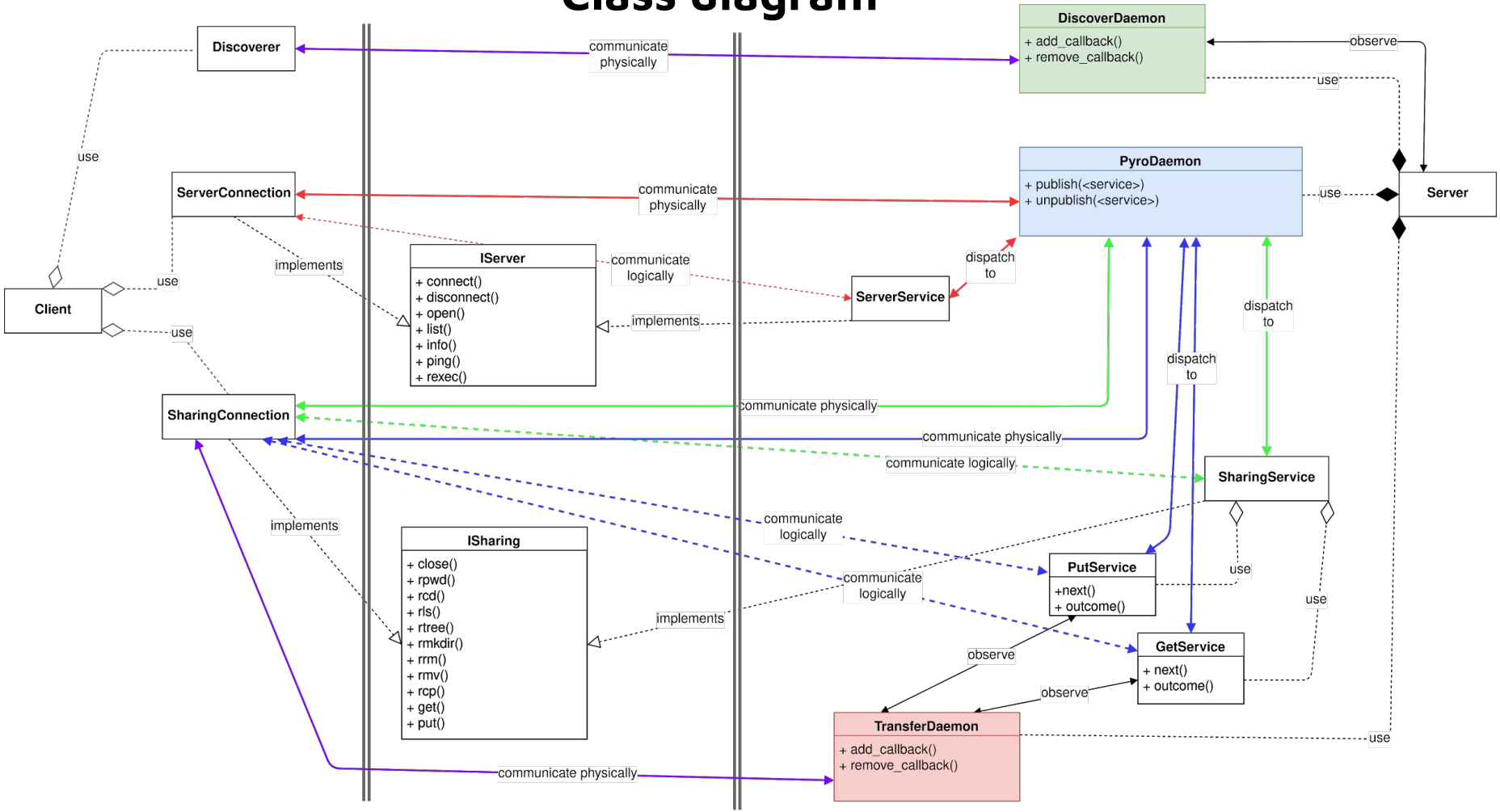
Connection establishment commands
scan
connect
disconnect
open
close

Transfer commands
get
put

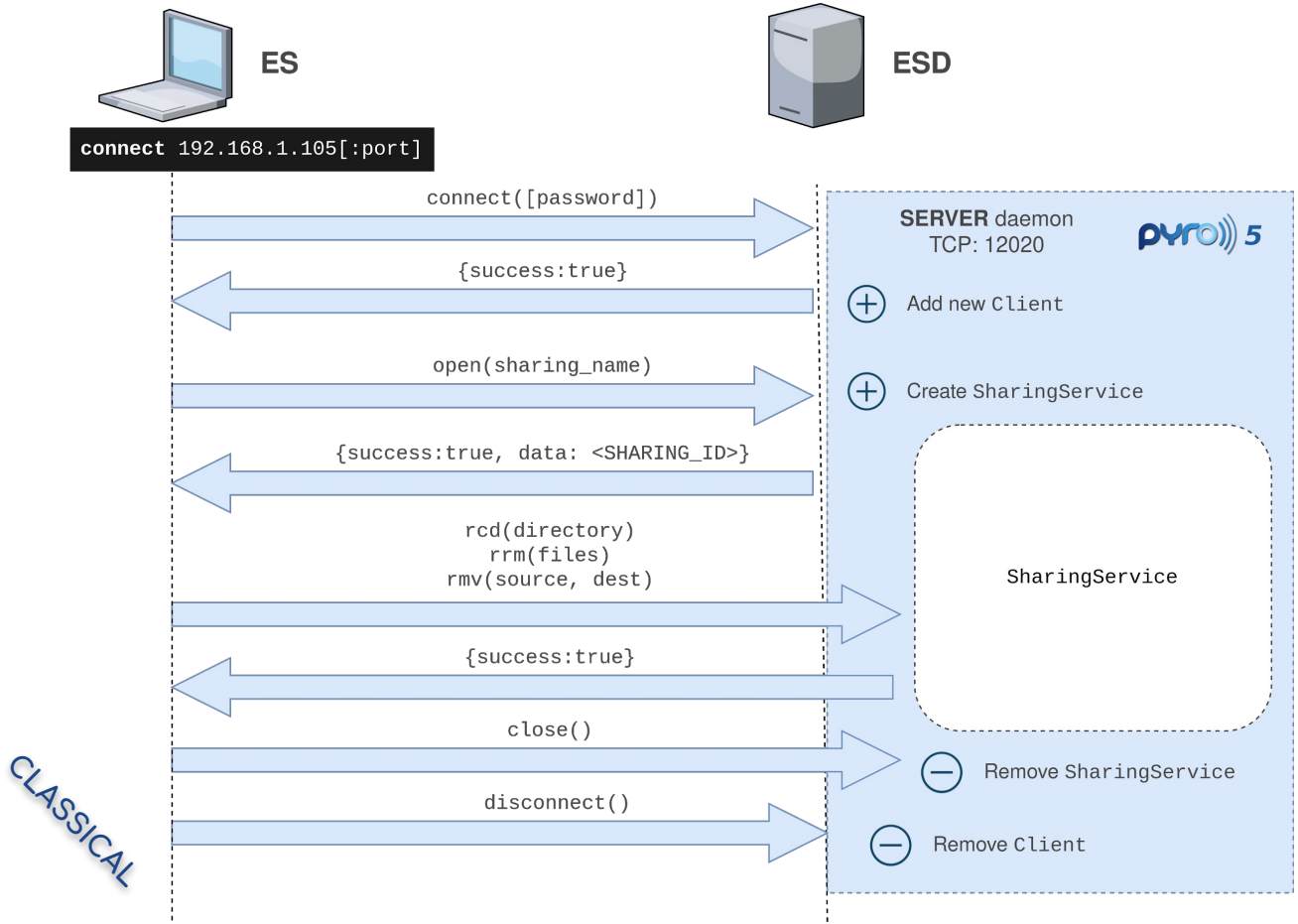
Misc commands
help
exit
trace
verbose

Server info commands
info
list
ping

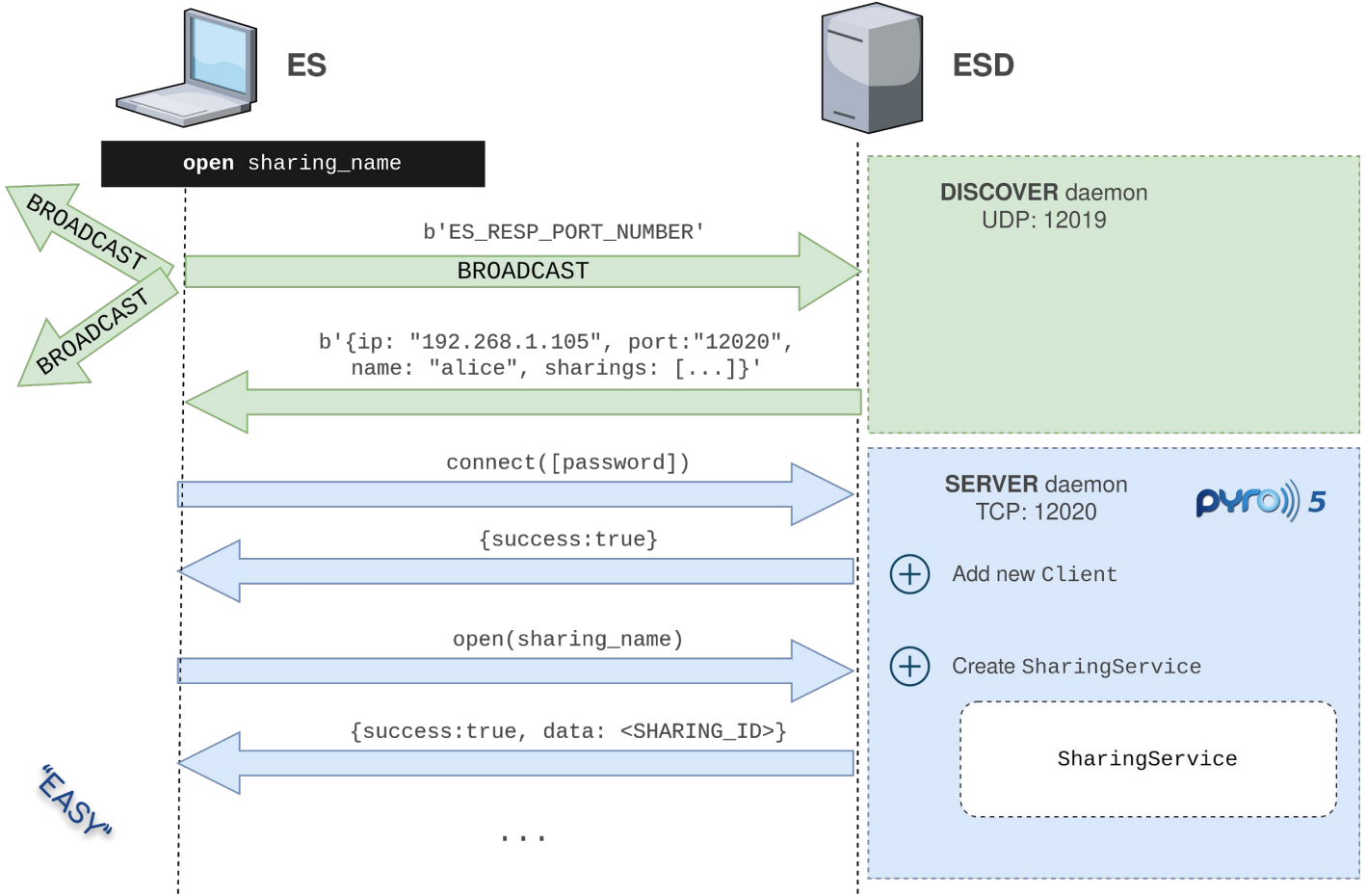
Class diagram



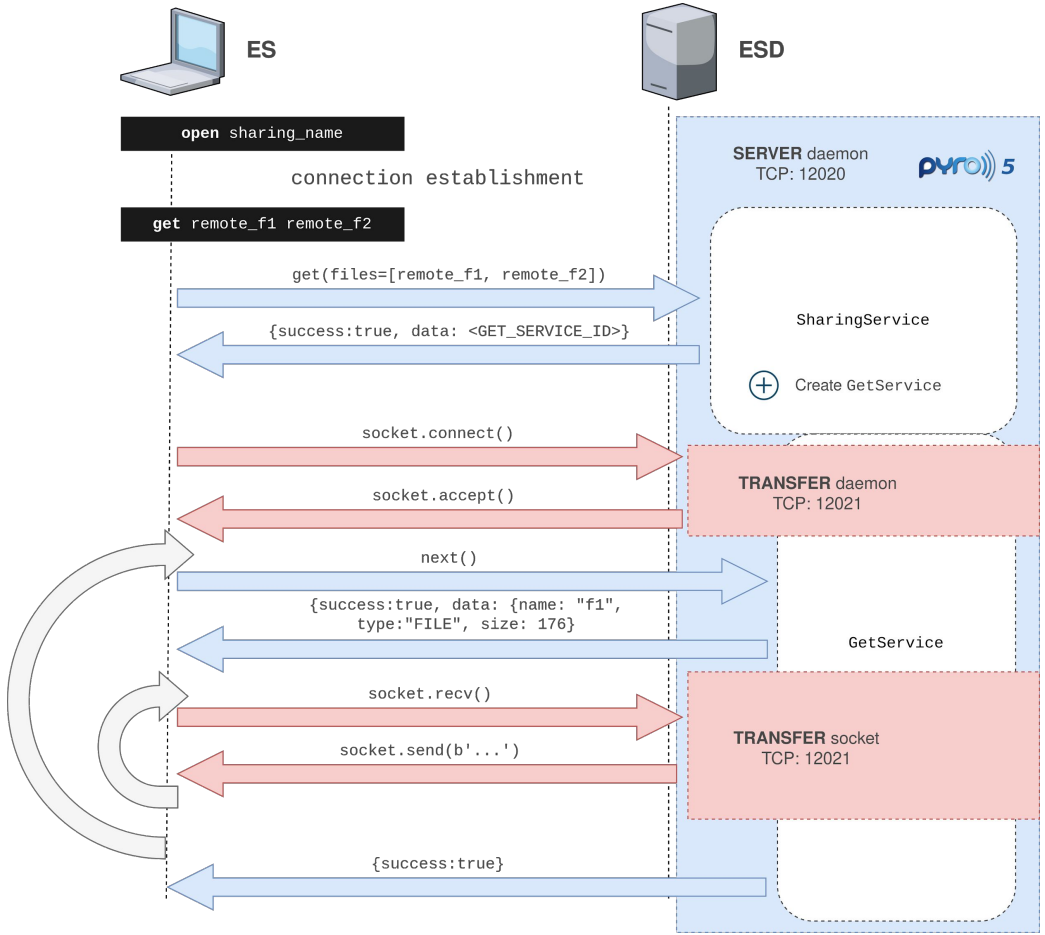
Connection establishment: DIRECTLY



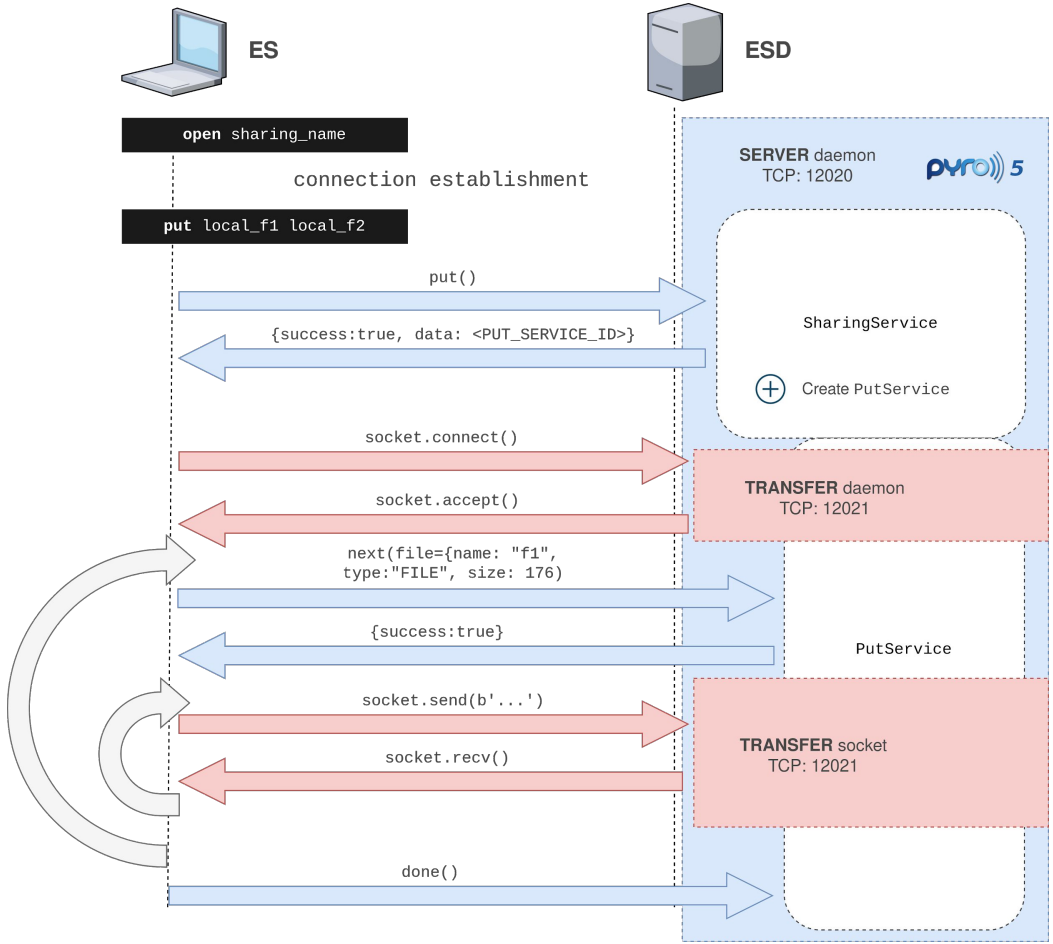
Connection establishment: DISCOVERING



File transfer: `get`



File transfer: `put`



A step inside: es

Connection establishment (DISCOVER)

Remote files management

Files transfer `get`

```
→  easyshare git:(master) ✗ python -m easyshare.es
/home/stefano/Develop/Python/easyshare> cd /tmp
/tmp> scan
1. stefano-arch (192.168.1.105:12020)
  DIRECTORIES
  • shared
/tmp> open shared
stefano-arch.shared:/ — /tmp> rtree
├── dir
│   ├── f3
│   └── f4
├── f1
└── f2
stefano-arch.shared:/ — /tmp> rmv f1 dir
stefano-arch.shared:/ — /tmp> rtree
├── dir
│   ├── f1
│   ├── f3
│   └── f4
└── f2
stefano-arch.shared:/ — /tmp> rrm dir/f4
stefano-arch.shared:/ — /tmp> rtree
├── dir
│   ├── f1
│   └── f3
└── f2
stefano-arch.shared:/ — /tmp> rcd dir
stefano-arch.shared:/dir — /tmp> get f1 f3
GET f1                          |████████| 100%     51KB/51KB            0s
GET f3                          |████████| 100%    128KB/128KB           0s
GET outcome: OK
Files        2  (179KB)
Time         0s
Avg. speed   20.4MB/s
stefano-arch.shared:/dir — /tmp>
```

A step inside: esd

Scenario 1.

When
Easy and fast sharing of one file or directory

How
Specifying sharing location as argument of the command

```
→  easyshare git:(master) ✗ python -m easyshare.esd /tmp/shared
================================

SERVER INFO

Name:               stefano-arch
Address:            192.168.1.105
Server port:        12020
Transfer port:      12021
Discover port:      12019
Auth:               none
SSL:                False
Remote execution:   False

================================

SHARINGS

* shared --> /tmp/shared

================================

RUNNING...

Client connected: 192.168.1.105:55196
Client connected: 192.168.1.105:55198
Client disconnected: 192.168.1.105:55196
```

A step inside: esd

Scenario 2.

When
Sharing of multiple files or directories

How
Specifying the path to the config file via **-c**

esd.conf

```
# ===== SERVER INFO =====

name=stefano-arch

# ===== SHARINGS =====

[download]
    path="/home/stefano/Downloads"

[shared]
    path="/tmp/shared"
    readonly=true
```

```
➜  easyshare git:(master) ✗ python -m easyshare.esd -c /tmp/esd.conf
================================

SERVER INFO

Name:              stefano-arch
Address:           192.168.1.105
Server port:       12020
Transfer port:     12021
Discover port:     12019
Auth:              none
SSL:               False
Remote execution:  False

================================

SHARINGS

* download --> /home/stefano/Downloads
* shared --> /tmp/shared

================================

RUNNING...
```

A step inside: esd

Scenario 2+.

When
Sharing of multiple files or directories with more security

How
Specifying the path to the (well configured) config file via **-c**

esd.conf

Server password (plain or hashed)

SSL

Read-only flag for specific sharings

```
# ===== SERVER INFO =====

name=stefano-arch

# Password (plain or hashed)
password=asecurepassword
#password=1$u6MaRLZprle5HWcksBmDsQ==

# SSL
ssl=true
ssl_cert="/tmp/cert.pem"
ssl_privkey="/tmp/privkey.pem"

# ===== SHARINGS =====

[download]
    path="/home/stefano/Downloads"

[shared]
    path="/tmp/shared"
    readonly=true
```

Need help?

```
help <command>
```

```
COMMAND
    open - open a remote sharing (eventually discovering it)

SYNOPSIS
    open SHARING_LOCATION
    o    SHARING_LOCATION

DESCRIPTION
    Open a sharing whose location is specified by SHARING_LOCATI-
    ON

    SHARING_LOCATION has the following syntax:
        <sharing_name>[@<server_name>|<address>[:<port>]]

    See the section EXAMPLES for more examples about SHARING_LOC-
    ATION.

    The following rules are applied for establish a connection:

    1. If SHARING_LOCATION is a valid <sharing_name> (e.g. share-
       d), a discover is performed for figure out to which serve-
       r the sharing belongs to.
    2. If SHARING_LOCATION has the form <sharing_name>@<server_n-
       ame>[:port] (e.g. shared@alice-arch) a discover is perfor-
       med as well as in case 1. and the <server_name> and the <-
       port> act only as a filter (i.e. the connection won't be
       established if they don't match).
    3. If SHARING_LOCATION has the form <sharing_name>@<address>-
       (e.g. shared@192.168.1.105) the connection will be tried
       to be established directly to the server at the default p-
       ort. If the attempt fails, a discover is performed for fi-
       gure out which port the server is really bound to and ano-
       ther attempt is done.
    4. If SHARING_LOCATION has the form <sharing_name>@<address>-
       :<port> (e.g. shared@192.168.1.105:12020) the connection
:
```

```
COMMAND
    rls - list remote directory content

SYNOPSIS
    rls [OPTION]... [DIR]

    rls [OPTION]... [SHARING_LOCATION] [DIR]

    SHARING_LOCATION must be specified if and only if not-
    already connected to a remote sharing. In that case t-
    he connection will be established before execute the
    command, as "open SHARING_LOCATION" would do.

    Type "help open" for more information about SHARING_L-
    OCATION format.

DESCRIPTION
    List content of the remote DIR or the current remote
    directory if no DIR is specified.

OPTIONS
    -a, --all                  show hidden files too
    -g, --group                group by file type
    -l                         show more details
    -r, --reverse              reverse sort order
    -s, --sort-size            sort by size
    -S                         show files size

SEE ALSO
    Type "help ls" for the local analogous.
(END)
```

Not enough (help)?

verbose, trace

```
/home/stefano/Develop/Python/easyshare> verbose 4
Verbosity = 4 (debug)
[DEBUG] {easyshare.es.shell} Command execution: OK
[DEBUG] {easyshare.es.shell} Connected to esd : False
[DEBUG] {easyshare.es.shell} Connected to sharing: False
/home/stefano/Develop/Python/easyshare> connect stefano-arch
[DEBUG] {easyshare.es.shell} Detected command 'connect'
[INFO]  {easyshare.es.client} Executing connect(['stefano-arch'])
[DEBUG] {easyshare.es.client} serverconnection_parser_provider -> 'not connect' parser
[DEBUG] {easyshare.args} Inspecting argument stefano-arch
[DEBUG] {easyshare.args} Considering 'stefano-arch' as positional parameter
[DEBUG] {easyshare.args} 0 unparsed args w/o positional: []
[DEBUG] {easyshare.args} 1 positional arguments: ['stefano-arch']
[DEBUG] {easyshare.args} Parsing and append to bucket...
        NoopParams : 1 mandatory, 0 optional
        params = ['stefano-arch']
        offset = 0
[DEBUG] {easyshare.args} [0] Mandatory: checking validity: param_ok_hook('stefano-arch')
[DEBUG] {easyshare.args} Parsing and appending to bucket (taking 0:1)
[INFO]  {easyshare.args} > ['stefano-arch']
[DEBUG] {easyshare.args} 0 unparsed args: []
[INFO]  {easyshare.es.client} Parsed command arguments
{
    "parsed": {
        "null": [
            "stefano-arch"
        ]
    },
    "unparsed": []
}
[INFO]  {easyshare.es.client} >> CONNECT
[DEBUG] {easyshare.es.common} ServerLocation.parse() -> stefano-arch
```

```
/tmp> trace
Tracing = 1 (enabled)
/tmp> open download
>> <broadcast>:12019
>>   DISCOVER b'\xd0o' (53359)
<< 192.168.1.105:53615
<<   DISCOVER
{
    "success": true,
    "data": {
        "name": "stefano-arch",
        "sharings": [
            {
                "name": "download",
                "ftype": "dir",
                "read_only": true
            },
            {
                "name": "shared",
                "ftype": "dir",
                "read_only": true
            }
        ],
        "ssl": false,
        "auth": false,
        "ip": "192.168.1.105",
        "port": 12020,
        "discoverable": true,
        "discover_port": 12019
    }
}
>> 192.168.1.105:12020 (stefano-arch)
>>   connect (password=None)
<< 192.168.1.105:12020 (stefano-arch)
<<   connect
{
    "success": true
}
>> 192.168.1.105:12020 (stefano-arch)
>>   open ("download")
<< 192.168.1.105:12020 (stefano-arch)
<<   open
{
    "success": true,
    "data": "25154f0ed37a4c46b802157238c77253"
}
stefano-arch.download:/ — /tmp>
```

Other features

- **Command** and command's **options** completion with TAB
- Local and remote **files** completion with TAB

- Designed for work behind **NAT** too
  (apart from the broadcast discovery)

- Man pages available
  ```
  man es
  man esd
  ```

- Helper for generate passwords hashes and configuration file
  `es-tools`

Easy to install, as well

```
pip install easyshare
```

Links

- https://github.com/Docheinstein/easyshare

- https://pypi.org/project/easyshare/

```
#!/bin/sh
exit 0
```