Hackersh Documentation

Release 0.3.dev0

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October 12, 2013

CONTENTS

Welcome to Hackersh's documentation. This documentation is divided into different parts. I recommend that you get started with *Installation* and then head over to the *Quickstart*. If you'd rather dive into the internals of Hackersh, check out the *API Reference* documentation.

Hackersh uses Pythonect as its scripting language. To learn more about Pythonect, visit Pythonect's Web site <http://www.pythonect.org>

Note: This is the main documentation for the Hackersh project. The contents of this site are automatically generated via Sphinx based on the Python docstrings throughout the code and the reStructuredText documents in the doc/ directory of the git repository. If you find an error in the documentation, please report it in the bug tracker here, or even better, submit a pull request!

CHAPTER

ONE

USER'S GUIDE

This part of the documentation, which is mostly prose, begins with some background information about Hackersh, then focuses on step-by-step instructions for getting the most out of Hackersh.

1.1 Introduction

Read this before you get started with Hackersh. This hopefully answers some questions about the purpose and goals of the project, and when you should or should not be using it.

1.1.1 Philosophy

"The whole is greater than the sum of its parts." Aristotle

1.1.2 What is Hackersh?

Hackersh ("Hacker Shell") is a free and open source command-line shell and scripting language designed especially for security testing.

Just like Linux system administrators are using shell scripting to automate tasks:

```
> /sbin/ifconfig | /bin/grep "inet addr:" | /usr/bin/cut -d: -f2 | /usr/bin/awk '{ print $1 }'
127.0.0.1
```

Hackersh aims to help security testers to automate their tasks:

```
> /sbin/ifconfig | /bin/grep "inet addr:" | /usr/bin/cut -d: -f2 | /usr/bin/awk '{ print $1 }' | ipv4

Properties:
-----------

+--------------+-----------+
| Property     | Value     |
+--------------+-----------+
| Ipv4_Address | 127.0.0.1 |
+--------------+-----------+
| Name         | 127.0.0.1 |
+--------------+-----------+
| Service      | HTTP      |
+--------------+-----------+
| Proto        | TCP       |
```

```
+--------------+-----------+
| Port         | 80        |
+--------------+-----------+

Graph:
------

127.0.0.1 <via str>
`-127.0.0.1 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap_result_#1>
    `-Found #4 Vulnerabilities <via nikto>

Vulnerabilities:
----------------

+-------------------------------------------------------------------------------+-----------------
| VULNERABILITY DESCRIPTION                                                     | URL
+-------------------------------------------------------------------------------+-----------------
| ETag header found on server, inode: 436622, size: 177, mtime: 0x4e22ce6d50080 | http://localhost
+-------------------------------------------------------------------------------+-----------------
| Allowed HTTP Methods: GET, HEAD, POST, OPTIONS                                | http://localhost
+-------------------------------------------------------------------------------+-----------------
| /server-status: This reveals Apache information. Comment out appropriate line in | http://localhost
| httpd.conf or restrict access to allowed hosts.                               |
+-------------------------------------------------------------------------------+-----------------
| /icons/README: Apache default file found.                                     | http://localhost
+-------------------------------------------------------------------------------+-----------------
```

It is written in Python and uses Pythonect as its scripting engine.

Continue to *Installation* or *Quickstart*

1.2 Installation

This part of the documentation covers the installation of Hackersh. The first step to using any software package is getting it properly installed.

1.2.1 Installing Hackersh

Hackersh requires Python version 2.6 and greater, but it will not work (yet) with Python 3. Dependencies are listed in `setup.py` and will be installed automatically as part of any of the techniques listed below.

Note: Hackersh will ***NOT*** install 3rd party security tools as part of its installation. You have to manually download and install each and every security tool that you wish to use in Hackersh. Alternatively, you can install Hackersh in a Linux distribution such as BackTrack, Kali, or Pentoo and enjoy the already installed tools.

Distribute & Pip

Installing Hackersh is simple with pip:

```
$ pip install hackersh
```

or, with easy_install:

```
$ easy_install hackersh
```

Note: Using easy_install is discouraged. Why? Read here.

1.2.2 Download the Source

You can also install Hackersh from source. The latest release (0.3) is available from GitHub.

- tarball
- zipball

Once you have a copy of the source, unzip or untar the source package, cd to the new directory, and:

```
$ python setup.py install
```

To download the full source history from Git, see *Source Control*.

Staying Updated

The latest version of Hackersh will always be available here:

- PyPi: http://pypi.python.org/pypi/hackersh/
- GitHub: http://github.com/ikotler/hackersh/

When a new version is available, upgrading is simple.

```
$ pip install hackersh --upgrade
```

1.3 Quickstart

Eager to get started? This page gives a good introduction to Hackersh. It assumes that:

- You already have Hackersh installed. If you do not, head over to the *Installation* section.
- You are familiar with Pythonect. If you aren't, head over to the Pythonect Tutorial

1.3.1 Using the Shell

Once Hackersh is *installed*, you can run it from the command-line like this:

```
$ hackersh
Hackersh Version 0.3.0
Copyright (C) 2013 Itzik Kotler
Visit http://www.hackersh.org for updates.

********************************************************************************
*                                                                              *
*                                                                              *
*  Welcome to Hacker Shell Version 0.3.0                                       *
*                                                                              *
*                                                                              *
********************************************************************************
```

```
>
```

Typing `help` or `?` once in the Hackersh shell prompt will list the commands available to you.

```
> help

Shell Builtin Commands
======================

    Command        Description
    -------        -----------
    ?              Display information about builtin commands
    exit           Exit the shell
    help           Display information about builtin commands
    info           Queries the supplied component or components for information
    quit           Exit the shell
    show           Displays components
```

Type `help X` to find out more about the command `X`.

```
> help show
Usage: show [all|internal|external|root]
```

Or pass the command-line option `-h` or `--help` to the command:

```
> show -h
Usage: show [all|internal|external|root]
```

When running interactively (i.e. when commands are read from a tty), Hackersh will employs the GNU readline library to provide some useful command line editing facilities, as well as to save command history. Pressing `Tab` will autocomplete commands, components, directories, files, and more.

```
> info ipv4_
ipv4_address  ipv4_range
```

Pressing `Up` and `Down` will navigate through all the history commands entered at the prompt.

The command history is saved in the `.hackersh_history` file in your home directory between different invocations of the shell.

1.3.2 Running Commands

Hackersh runs commands like other shells:

```
> /bin/ping -c 3 192.168.1.110

PING 192.168.1.110 (192.168.1.110) 56(84) bytes of data.
64 bytes from 192.168.1.110: icmp_req=1 ttl=64 time=0.224 ms
64 bytes from 192.168.1.110: icmp_req=2 ttl=64 time=0.064 ms
64 bytes from 192.168.1.110: icmp_req=3 ttl=64 time=0.449 ms

--- 192.168.1.110 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1998ms
rtt min/avg/max/mdev = 0.064/0.245/0.449/0.158 ms

> /usr/bin/nmap 192.168.1.110 -p 80

Starting Nmap 6.25 ( http://nmap.org ) at 2013-09-22 17:08 IDT
```

```
Nmap scan report for 192.168.1.110
Host is up (0.00026s latency).
PORT   STATE SERVICE
80/tcp open  http
MAC Address: 08:00:27:AD:A8:E7 (Cadmus Computer Systems)

Nmap done: 1 IP address (1 host up) scanned in 0.07 seconds

> /usr/bin/nikto -host 192.168.1.110 -port 80

- Nikto v2.1.4
---------------------------------------------------------------------------
+ Target IP:          192.168.1.110
+ Target Hostname:    192.168.1.110
+ Target Port:        80
+ Start Time:         2013-09-23 17:09:46
---------------------------------------------------------------------------
+ Server: Apache/2.2.16 (Debian)
+ Retrieved x-powered-by header: PHP/5.3.3-7+squeeze15
+ Apache/2.2.16 appears to be outdated (current is at least Apache/2.2.17). Apache 1.3.42 (final rele
+ DEBUG HTTP verb may show server debugging information. See http://msdn.microsoft.com/en-us/library/
+ OSVDB-12184: /index.php?=PHPB8B5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals potentially sensitive
+ OSVDB-3268: /files/: Directory indexing found.
+ OSVDB-3092: /files/: This might be interesting...
+ OSVDB-3268: /img/: Directory indexing found.
+ OSVDB-3092: /img/: This might be interesting...
+ OSVDB-3268: /icons/: Directory indexing found.
+ OSVDB-3233: /icons/README: Apache default file found.
+ 6448 items checked: 0 error(s) and 10 item(s) reported on remote host
+ End Time:           2013-09-23 17:09:55 (9 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested
```

If a command starts with / (slash), ./ (dot slash), or ../ (dot dot slash) it is executed as a system command.

1.3.3 Running Components

Hackersh comes with a library of components for security testing. The components are like building blocks. They offer various assemblies with their parts being interchangeable.

Hackersh runs (and pipes) components like commands: you type a component name, followed by its arguments.

```
> "192.168.1.110" | ipv4_address | nmap -p 80 | nikto

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
+--------------+---------------+
| Proto        | TCP           |
```

```
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap -p 80>
    `-Found #10 Vulnerabilities <via nikto>

Vulnerabilities:
----------------

+-----------------------------------------------------------------------------------------------+---------
| VULNERABILITY DESCRIPTION                                                                     | URL
+-----------------------------------------------------------------------------------------------+---------
| Retrieved x-powered-by header: PHP/5.3.3-7+squeeze15                                          | http://1
+-----------------------------------------------------------------------------------------------+---------
| Apache/2.2.16 appears to be outdated (current is at least Apache/2.2.17). Apache 1.3.42      | http://1
| (final release) and 2.0.64 are also current.                                                  |
+-----------------------------------------------------------------------------------------------+---------
| DEBUG HTTP verb may show server debugging information. See http://msdn.microsoft.com/en-      | http://1
| us/library/e8z01xdh%28VS.80%29.aspx for details.                                              |
+-----------------------------------------------------------------------------------------------+---------
| /index.php?=PHPB8B5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals potentially sensitive        | http://1
| information via certain HTTP requests that contain specific QUERY strings.                   |
+-----------------------------------------------------------------------------------------------+---------
| /files/: Directory indexing found.                                                            | http://1
+-----------------------------------------------------------------------------------------------+---------
| /files/: This might be interesting...                                                         | http://1
+-----------------------------------------------------------------------------------------------+---------
| /img/: Directory indexing found.                                                              | http://1
+-----------------------------------------------------------------------------------------------+---------
| /img/: This might be interesting...                                                           | http://1
+-----------------------------------------------------------------------------------------------+---------
| /icons/: Directory indexing found.                                                            | http://1
+-----------------------------------------------------------------------------------------------+---------
| /icons/README: Apache default file found.                                                     | http://1
+-----------------------------------------------------------------------------------------------+---------
```

You can mix between Hackersh components and any third-party binaries (e.g. cat, grep, and etc.) as long as the binaries output (via stdout) something meaningful:

```
> /bin/cat /etc/hosts | /bin/grep "127.0.0.1" | /usr/bin/awk '{ print $1 }' | /usr/bin/tr -d '\n' | :

127.0.0.1 <via str>
`-127.0.0.1 <via ipv4_address>
  +-80/tcp (HTTP) <via nmap_result_#1>
  `-22/tcp (SSH) <via nmap_result_#0>
```

1.3.4 Getting Help

To get help on a specific component, use the built-in `info` command:

```
> info ipv4_address
Component: ipv4_address
Version: 0.1.0
Source: /usr/local/lib/python2.7/dist-packages/Hackersh-0.3.dev0-py2.7.egg/hackersh/components/interr
Type: RootComponent
Provided by: Itzik Kotler <xorninja@gmail.com>
Filter: None
Query: None
Description:
   Convert String to IPv4 Address
```

To get a specific component usage, pass the command-line `-h` or `--help` to it:

```
> nmap -h
...
...
...
```

Don't worry if the application don't take `-h` or `--help` options. Hackersh will automatically map it to the correct command line option.

1.3.5 Debugging

Hackersh offers two debugging options: Shell Debugging and Component Debugging. These options can be enabled together, or enabled separately.

To debug the shell simply pass the command line option `-v` to increment the verbosity:

```
$ hackersh -vvv
```

To debug a specific Hackersh component, just pass: `debug=True` to it and see what the input and output strings are:

```
> "127.0.0.1" | ipv4_address | nmap('-p 80', debug=True) | nikto
```

1.3.6 Return Values

Most Hackersh components take and output Context. Context is a directed graph where each node is a dictionary. The node dictionary contains key/value pairs that contain the properties of a single component execution result. Each node points to its *successor*, which is another properties dictionary of another single component result that is waiting on it to complete.

Hackersh starts with an empty Context and after a successful execution it will assign the result of the last returned Context to the _ (underscore) variable. In other words:

```
> "192.168.1.110"

192.168.1.110

> _ | ipv4_address

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
```

```
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>

> _ | nmap

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  +-80/tcp (HTTP) <via nmap_result_#1>
  +-22/tcp (SSH) <via nmap_result_#0>
  `-389/tcp (LDAP) <via nmap_result_#2>

> _ | nikto

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap_result_#1>
    `-Found #10 Vulnerabilities <via nikto>

Vulnerabilities:
----------------

+-------------------------------------------------------------------------------------------+---------
| VULNERABILITY DESCRIPTION                                                                 | URL
+-------------------------------------------------------------------------------------------+---------
| Retrieved x-powered-by header: PHP/5.3.3-7+squeeze15                                      | http://1
+-------------------------------------------------------------------------------------------+---------
| Apache/2.2.16 appears to be outdated (current is at least Apache/2.2.17). Apache 1.3.42  | http://1
| (final release) and 2.0.64 are also current.                                              |
+-------------------------------------------------------------------------------------------+---------
| DEBUG HTTP verb may show server debugging information. See http://msdn.microsoft.com/en- | http://1
| us/library/e8z01xdh%28VS.80%29.aspx for details.                                          |
```

```
+-------------------------------------------------------------------------------------------+---------
| /index.php?=PHPB8B5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals potentially sensitive    | http://1
| information via certain HTTP requests that contain specific QUERY strings.               |
+-------------------------------------------------------------------------------------------+---------
| /files/: Directory indexing found.                                                        | http://1
+-------------------------------------------------------------------------------------------+---------
| /files/: This might be interesting...                                                     | http://1
+-------------------------------------------------------------------------------------------+---------
| /img/: Directory indexing found.                                                          | http://1
+-------------------------------------------------------------------------------------------+---------
| /img/: This might be interesting...                                                       | http://1
+-------------------------------------------------------------------------------------------+---------
| /icons/: Directory indexing found.                                                        | http://1
+-------------------------------------------------------------------------------------------+---------
| /icons/README: Apache default file found.                                                 | http://1
+-------------------------------------------------------------------------------------------+---------
```

Is equal to:

```
> "192.168.1.110" | ipv4_address | nmap | nikto

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap_result_#1>
    `-Found #10 Vulnerabilities <via nikto>

Vulnerabilities:
----------------

+-------------------------------------------------------------------------------------------+---------
| VULNERABILITY DESCRIPTION                                                                 | URL
+-------------------------------------------------------------------------------------------+---------
| Retrieved x-powered-by header: PHP/5.3.3-7+squeeze15                                      | http://1
+-------------------------------------------------------------------------------------------+---------
| Apache/2.2.16 appears to be outdated (current is at least Apache/2.2.17). Apache 1.3.42  | http://1
| (final release) and 2.0.64 are also current.                                              |
+-------------------------------------------------------------------------------------------+---------
| DEBUG HTTP verb may show server debugging information. See http://msdn.microsoft.com/en- | http://1
| us/library/e8z01xdh%28VS.80%29.aspx for details.                                          |
```

```
+-------------------------------------------------------------------------------------------+---------
| /index.php?=PHPB8B5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals potentially sensitive    | http://1
| information via certain HTTP requests that contain specific QUERY strings.               |
+-------------------------------------------------------------------------------------------+---------
| /files/: Directory indexing found.                                                        | http://1
+-------------------------------------------------------------------------------------------+---------
| /files/: This might be interesting...                                                     | http://1
+-------------------------------------------------------------------------------------------+---------
| /img/: Directory indexing found.                                                          | http://1
+-------------------------------------------------------------------------------------------+---------
| /img/: This might be interesting...                                                       | http://1
+-------------------------------------------------------------------------------------------+---------
| /icons/: Directory indexing found.                                                        | http://1
+-------------------------------------------------------------------------------------------+---------
| /icons/README: Apache default file found.                                                 | http://1
+-------------------------------------------------------------------------------------------+---------
```

1.3.7 Conditional Expressions

Hackersh follows the Pythonect Control Flow Tools concept, and you can use the Context key/value pairs in a conditional expression:

```
> "192.168.1.110" | ipv4_address | nmap | _['PORT'] == '80'

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap_result_#1>
```

The expression may contain any number of Python Boolean Operations:

```
> "192.168.1.110" | ipv4_address | nmap | _['PORT'] == '8080' or _['SERVICE'] == 'HTTP'

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
```

```
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
`-80/tcp (HTTP) <via nmap_result_#1>
```

As well as Python functions:

```
> "192.168.1.110" | ipv4_address | nmap | int(_['PORT']) < 1024

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  +-80/tcp (HTTP) <via nmap_result_#1>
  +-22/tcp (SSH) <via nmap_result_#0>
  `-389/tcp (LDAP) <via nmap_result_#2>
```

1.3.8 Map, Reduce, and Filter

Hackersh uses Pythonect's automatic parallelization feature. Whenever a Hackersh component returns more than one context, it would automatically map each Context to it's own thread.

Most Hackersh components are one-to-one or one-to-many. For example the `print` component is one-to-one. It will print the current context on the flow:

```
> "192.168.1.110" | ipv4_address | nmap | print
Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | SSH           |
+--------------+---------------+
| Port         | 22            |
+--------------+---------------+

Graph:
------
```

```
192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-22/tcp (SSH) <via nmap_result_#0>


Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap_result_#1>


Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | LDAP          |
+--------------+---------------+
| Port         | 389           |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-389/tcp (LDAP) <via nmap_result_#2>
```

Some Hackersh components are many-to-one. They will always end with `_all` postfix. For example the `print_all` component is many-to-one. It will reduce all contexts to one context and print it:

```
> "192.168.1.110" | ipv4_address | nmap | print_all

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  +-80/tcp (HTTP) <via nmap_result_#1>
  +-22/tcp (SSH) <via nmap_result_#0>
  `-389/tcp (LDAP) <via nmap_result_#2>
```

Note: When running Hackersh interactively (i.e. when commands are read from a tty) it will automatically reduce all the contexts and print the reduced context result.

To filter a reduced context you can use the / (div, forward slash) operator and a boolean expression (like *Conditional Expressions*):

```
> _/"SERVICE == 'HTTP' or SERVICE == 'HTTPS'"

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap_result_#1>
```

Or:

```
> _/"PORT == '80' and PROTO == 'TCP'"

Properties:
-----------

+--------------+---------------+
| Property     | Value         |
+--------------+---------------+
| Port         | 80            |
+--------------+---------------+
| Ipv4_Address | 192.168.1.110 |
+--------------+---------------+
| Name         | 192.168.1.110 |
+--------------+---------------+
| Service      | HTTP          |
```

```
+--------------+---------------+
| Proto        | TCP           |
+--------------+---------------+

Graph:
------

192.168.1.110 <via str>
`-192.168.1.110 <via ipv4_address>
  `-80/tcp (HTTP) <via nmap_result_#1>
```

Note: As oppose to *Conditional Expressions*. This Query Language doesn't require `_[]` around context key names

---

1.3.9 Importing and Exporting Context

Hackersh lets you export and import your work at any time. You can use the `write` component to save a given context (or `write_all` to save all contexts) into file:

```
> "192.168.1.110" | ipv4_address | nmap | nikto | write 'web.json'
```

Reading it back is as easy as this:

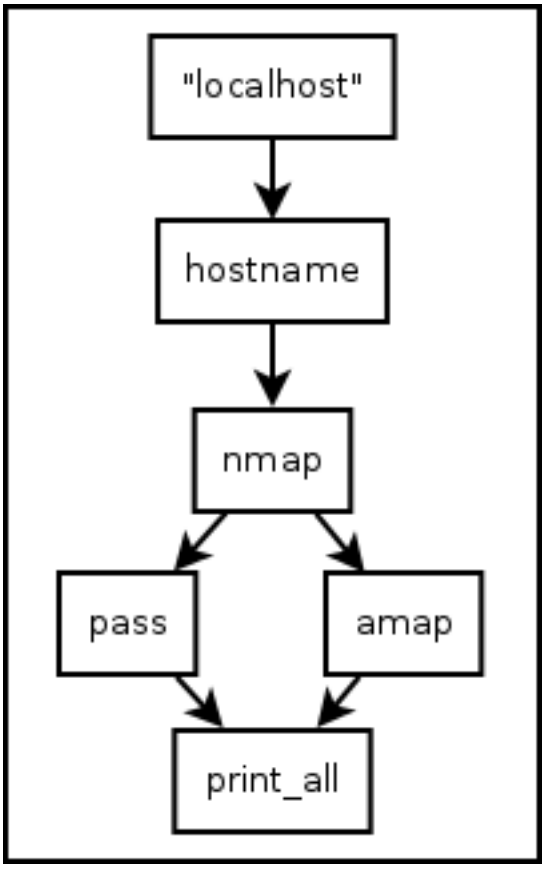
```
> read 'web.json' | print_all
```

The file format is determined by the extension you use in the file name (i.e., .json for a JSON file). Type `info read` or `info write` to see a complete list of supported file formats.

1.3.10 Writing and Running Scripts

Hackerh uses Pythonect as it's scripting engine. Pythonect provides both a visual programming language and a text-based scripting language.

The visual programming language is based on the idea of a diagram with "boxes and arrows":



Note: This is an export (PNG) of a diagram made in Dia. It's not actually a Hackersh script. The script is the actual **.dia** file.

Running a diagram is as easy as:

```
$ hackersh alternate_nmap_amap_scan.dia
```

The text-based scripting language (same syntax as used in the shell) aims to combine the quick and intuitive feel of shell scripting, with the power of Python. Open your favorite editor and type:

```
"localhost" -> hostname -> nmap -> [pass, amap] -> print_all
```

Save it as `alternate_nmap_amap_scan.hs` and run it as follows:

```
$ hackersh alternate_nmap_amap_scan.hs
```

Note: On BSD'ish Unix systems, Hackersh text-based scripts can be made directly executable, by putting the line (The #! must be the first two chars of the file):

```
#! /usr/bin/env hackersh
```

(assuming that Hackersh is on the user's PATH) at the beginning of the text-based script and giving the file an executable mode.

For more examples (in both, visual and text flavors) see the examples/ directory.

1.4 Development

Hackersh is under active development, and contributors are welcome.

If you have a feature request, suggestion, or bug report, please open a new issue on GitHub.

1.4.1 Contributor License Agreement

Before we can accept code, patches or pull requests on GitHub, there's a quick web form we need you to fill out here (**scroll to the bottom!**).

Hackersh's CLA is a copy of the one used by Sun Microsystems for all contributions to their projects.

This particular agreement has been used by other software projects in addition to Sun and is generally accepted as reasonable within the Open Source community.

More about CLAs

1.4.2 Source Control

Hackersh source is controlled with Git, the lean, mean, distributed source control machine.

The repository is publicly accessable.

```
git clone git://github.com/ikotler/hackersh.git
```

The project is hosted on GitHub.

Git Branch Structure

Feature / Hotfix / Release branches follow a Successful Git Branching Model. Git-flow is a great tool for managing the repository. I highly recommend it.

`develop` The "next release" branch. Likely unstable.

`master` Current production release (0.3) on PyPi.

Each release is tagged.

When submitting patches, please place your feature/change in its own branch prior to opening a pull reqeust on GitHub.

1.4.3 Adding New Components

TBD

1.4.4 Building the Docs

Documentation is written in the powerful, flexible, and standard Python documentation format, reStructured Text. Documentation builds are powered by the powerful Pocoo project, Sphinx. The *API Documentation* is mostly documented inline throughout the module.

The Docs live in `hackersh/doc`. In order to build them, you will first need to install Sphinx:

```
$ pip install sphinx
```

Then, to build an HTML version of the docs, simply run the following from the **doc** directory:

```
$ make html
```

Your `doc/_build/html` directory will then contain an HTML representation of the documentation, ready for publication on most web servers.

You can also generate the documentation in **epub**, **latex**, and **json**.

CHAPTER

TWO

API REFERENCE

If you are looking for information on a specific function, class or method, this part of the documentation is for you.

Note: Until the first *stable* Hackersh version (1.0.0) is released, we reserve the right to break the API at any time.

2.1 `hackersh` — Parse and execute Hackersh code

This Python module provides the capability to parse and evaluate a string as Hackersh code

`hackersh.`**`parse`**(*source*)

Parse text-mode Hackersh scripting language into a directed graph (i.e. networkx.DiGraph)

Args: source: A string representing text-based Hackersh code.

Returns: A directed graph (i.e. networkx.DiGraph) of Hackersh symbols.

Raises: SyntaxError: An error occurred parsing the code.

`hackersh.`**`eval`**(*source*, *namespace*)

Evaluate Hackersh code in the context of locals.

Args: source: A string representing text-based Hackersh code or networkx.DiGraph instance. namespace: A dictionary with components.

Returns: The return value is the result of the evaluated code.

Raises: SyntaxError: An error occurred parsing the code.

CHAPTER

THREE

ADDITIONAL NOTES

Design notes, legal information and changelog are here for the interested.

3.1 Hackersh Changelog

Hackersh Changelog

HEAD

o Delete internal component "submit" for now. It will be back in the future, together with a nice set of HTTP components.

o Rename "iterate_links" to "web_crawler". For example: "http://localhost" -> url -> web_crawler -> ...

o All builtin shell commands and external components will display usage if *-h* or *–help* command line is passed. Example: nmap -h

o Introduce *clipboard* - new internal component for pasting text from Clipboard. Example: (Copy a URL) and then *clipboard | url | w3af*

o Introduce *regex_expand* - new internal component for inverting Regex. Example: "http://localhost/index[0-9].html" -> regex_expand -> url

o Root Components can be piped via __STDIN__ key in Context

o Add Components: *write*, *write_all*, and *read* to Write/Read Contexts. For more info see: *info write*, *info write_all*, and *info read*

o Hackersh loads Environment Variables on Load. For example: IPV4_ADDRESS="127.0.0.1" ./bin/hackersh -c '_ | nmap | print_all'

o Support Multi-Line in Interactive Console via Backslash ('). For example:

show all

Or: x = 5 And etc.

o *print* component will print a given context, while *print_all* will join (i.e. reduce) all contexts into a single tree and print that tree.

o Components can return Component-level Errors via HackershError() class. Aggregation occurs at Console-level prior to printing the return value.

o Hackersh Console Prompt can be customize via PROMPT variable. Example: PROMPT='% '

o Autocomplete with TAB. Examples: sho<TAB> info nm<TAB> "127.0.0.1" | <TAB> "127.0.0.1" | ipv4_<TAB> and etc.

o Add *show* Command (e.g. show)

o Add *info* Command (e.g. info nmap, info ipv4_address, and etc.)

o Add *help* Command (e.g. help help, help exit, and etc.)

o And Limited auto-ocomplete for Shell-like expressions (e.g. ./<TAB> and /<TAB>)

o Automatically Handle (i.e. return False) and Log Exceptions from Components. To see the a given Component Exceptions use debug=True

o Support realtime STDOUT and STDERR output via debug=True (e.g. "127.0.0.1" -> ipv4_address -> nmap(debug=True))

o Support Shell-style Arg Passing (i.e. "127.0.01" -> ipv4_address -> nmap -p22)

o Support "Smooth" Shell Pipeline Experience (i.e. /bin/cat /etc/hosts | /usr/bin/grep "127.0.0.1" | /usr/bin/awk '{ print $1 }' | /usr/bin/tr -d 'n' | ipv4_address | mmap)

o Change DEAFULT_QUERY and DEFAULT_FILTER to support the new Graph Search

Language. Example: 'context['PROTO'] == "TCP" and context['PORT'] == "80"'

Changed to: 'PROTO == "TCP" and PORT == "80"'

o Context can be searched via '/' (read: div) operator

Example: "127.0.0.1" -> ipv4_address -> nmap

Then: _/"PORT == '80"' -> nikto

Or: _/"PROTO == 'TCP"'/"PORT == '21"' -> ...

And etc.

o Component Entry Point is changed from run() to main(). Use run() for external inovcation (i.e. from The Shell, or Python Code) and main() for internal inovcation (i.e. from another Component). The run() method will call the main() method, but will perform init tasks before doing so.

o Context is now a Directed Graph

o Remove RemoteSessionContext, there's only one Context Object: class Context

o Delete _ordereddict.py

Hackersh 0.2 [2013-05-02]

o Introduce *dnsdict6* - new external component for: Information Gathering / Network Analysis / DNS Analysis dnsdict6 v1.8 (c) 2011 by van Hauser / THC <vh@thc.org> www.thc.org Example: "hackersh.org" -> domain -> dnsdict6("-4 -s") -> ...

o Implement SimpleRegExHandler class - a new Pseudo SAX Content Handler class for processing output using regex

o amap, nikto, nmap, ping, w3af, xprobe2, and browse: Change DEFAULT_QUERY to evaluate context['IPV4_ADDRESS'] before context['HOSTNAME']

o Implement NbtScanStdoutOutputHandler class. Rewrite nbtscan to use it

o Implement SqlMapStdoutOutputHandler class. Rewrite sqlmap to use it

o Implement StdoutOutputHandler - a new Pseudo SAX Content Handler base class for stdout processing

o Implement ExternalComponentStreamOutput - a new base class for generic SAX-style output parsing. Change ExternalComponentStdoutOutput and ExternalComponentFileOutput to inherit from it.

o Implement shell_split() and replace shlex.split() with it. shell_split() will not remove double quotes (i.e. "") when splitting DEFAULT_QUERY.

o sqlmap: Change DEFAULT_QUERY to use "inline IF" to avoid:

TypeError: unsupported operand type(s) for +: 'bool' and 'str'

Whenever: context['COOKIES'] = False

o Introduce *ipv6_address* - new root component for processing IPv6 Address. Example: "::1" -> ipv6_address -> ...

o Introduce *domain* - new root component for processing domain names. Example: "hackersh.org" -> domain -> ...

o Implement HackershError Exception class and add 3 new error messages: XXX: not enough data to start (if Component Filter is False) XXX: command not found (if Ext. Component filename is missing) XXX: unable to parse (if all Output Handlers failed)

o Split hackersh/network.py and hackersh/misc.py into multiple files and implement a simple plug-in architecture to load them during startup

o Add support for BackTrack 5R3 and 5R2

Hackersh 0.1 [2013-04-01]

o Initial commit

3.2 License

Hackersh licensed under GPLv2+:

```
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                       Version 2, June 1991

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```
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