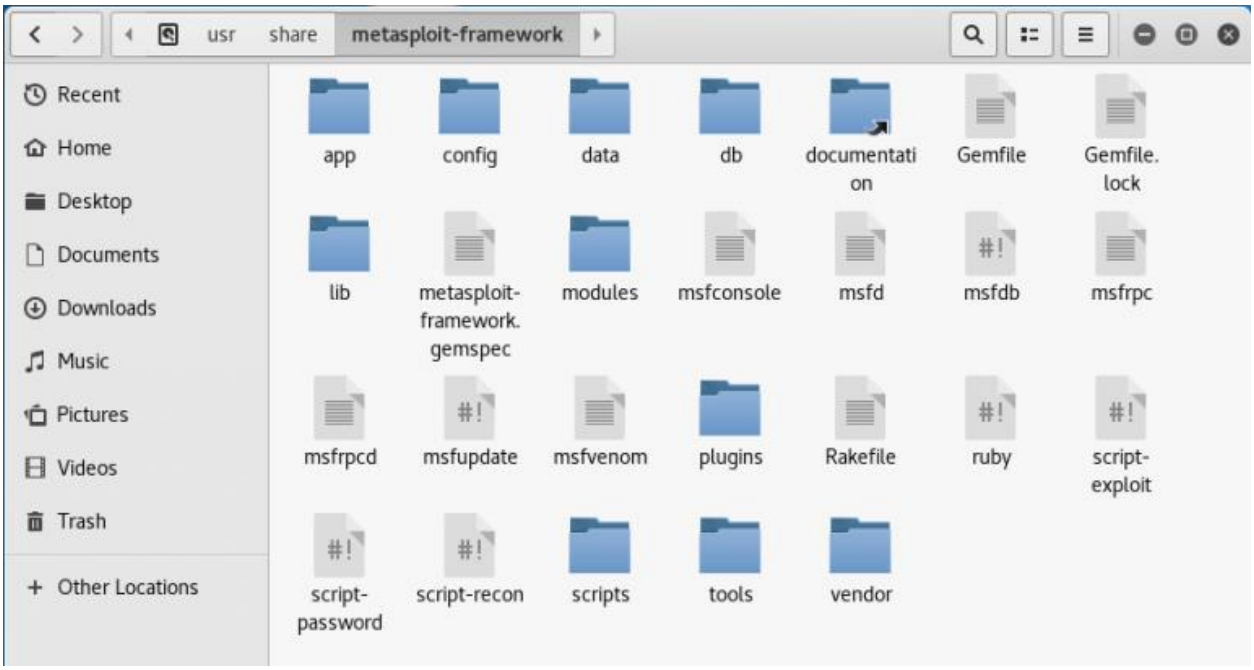
# Understanding the Metasploit Architecture

One can more easily understand the Metasploit architecture by taking a look under its hood. In learning how to use Metasploit, take some time to make yourself familiar with its filesystem and libraries. In Kali Linux, Metasploit is provided in the metasploit-framework package and is installed in the **/usr/share/metasploit-framework** directory, the top-level of which is shown below.




The Metasploit filesystem

## Metasploit Filesystem

The MSF filesystem is laid out in an intuitive manner and is organized by directory. Some of the more important directories are briefly outlined below.

### data

The data directory contains editable files used by Metasploit to store binaries required for certain exploits, wordlists, images, and more.

```
root@kali:~# ls /usr/share/metasploit-framework/data/
cpuinfo              ipwn           meterpreter  snmp            webcam
eicar.com            isight.bundle  mime.yml     sounds          wmap
eicar.txt            john.conf      msfcrawler   SqlClrPayload   wordlists
emailer_config.yaml  lab            passivex     templates
exploits             logos          php          vncdll.x64.dll
flash_detector       markdown_doc   post         vncdll.x86.dll
```

**documentation**

As its name suggests, the documentation directory contains the available documentation for the framework.

```
root@kali:~# ls /usr/share/metasploit-framework/documentation/
changelog.Debian.gz  CONTRIBUTING.md.gz  developers_guide.pdf.gz  README.md
CODE_OF_CONDUCT.md   copyright           modules
```

**lib**

The lib directory contains the 'meat' of the framework code base.

```
root@kali:~# ls /usr/share/metasploit-framework/lib/
anemone         msfenv.rb         rbmysql.rb  sqlmap
anemone.rb      net               rex         tasks
enumerable.rb   postgres          rex.rb      telephony
metasm          postgres_msf.rb   robots.rb   telephony.rb
metasploit      rabal             snmp        windows_console_color_support.rb
msf             rbmysql           snmp.rb
```

**modules**

The modules directory is where you will find the actual MSF modules for exploits, auxiliary and post modules, payloads, encoders, and nop generators.

```
root@kali:~# ls /usr/share/metasploit-framework/modules/
auxiliary  encoders  exploits  nops  payloads  post
```

**plugins**

As you will see later in this course, Metasploit includes many plugins, which you will find in this directory.

```
root@kali:~# ls /usr/share/metasploit-framework/plugins/
aggregator.rb      ips_filter.rb  openvas.rb           sounds.rb
alias.rb           komand.rb      pcap_log.rb          sqlmap.rb
auto_add_route.rb  lab.rb         request.rb           thread.rb
beholder.rb        libnotify.rb   rssfeed.rb           token_adduser.rb
db_credcollect.rb  msfd.rb        sample.rb            token_hunter.rb
db_tracker.rb      msgrpc.rb      session_notifier.rb  wiki.rb
event_tester.rb    nessus.rb      session_tagger.rb    wmap.rb
ffautoregen.rb     nexpose.rb     socket_logger.rb
```

**scripts**

The scripts directory contains Meterpreter and other scripts.

```
root@kali:~# ls /usr/share/metasploit-framework/scripts/
meterpreter  ps  resource  shell
```

**tools**

The tools directory has various useful command-line utilities.

```
root@kali:~# ls /usr/share/metasploit-framework/tools/
context  dev  exploit  hardware  memdump  modules  password  recon
```

## Metasploit Libraries

There are a number of MSF libraries that allow us to run our exploits without having to write additional code for rudimentary tasks, such as HTTP requests or encoding of payloads. Some of the most important libraries are outlined below.

**Rex**

- The basic library for most tasks
- Handles sockets, protocols, text transformations, and others
- SSL, SMB, HTTP, XOR, Base64, Unicode

**Msf::Core**

- Provides the 'basic' API
- Defines the Metasploit Framework

**Msf::Base**

- Provides the 'friendly' API
- Provides simplified APIs for use in the Framework

Throughout this course, we will touch upon how to use other tools directly within Metasploit. Understanding how things are stored and related to the Metasploit filesystem will help you in using the msfconsole and the other Metasploit interfaces.