

[Handout] Contributing to the Insights Core Framework

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1 Prerequisites

- GNU/Linux
- Python 3.6
 - Fedora

```
$ sudo dnf install python36
```
 - CentOS

```
$ sudo yum install epel-release centos-release-scl
$ sudo scl enable rh-python36 bash
```
 - Ubuntu

```
$ sudo apt-get install python3-venv
$ pip install wheel
```
- git
- sos-report
 - Fedora

```
$ sudo dnf install sos
```
 - CentOS/RedHat

```
$ sudo yum install sos
```
 - Ubuntu

```
$ sudo apt-get install sosreport
```

2 Setup

- Setting up a development environment

```
$ mkdir ~/insights
$ cd ~/insights
# Clone the Insights Core repo
$ git clone https://github.com/RedHatInsights/insights-core.git
$ python3.6 -m venv .
$ source bin/activate
$ pip install -e insights-core[develop]

# Clone the plugin repo
$ git clone https://github.com/vishwanathjadhav/analysis-plugins.git
```

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3 Sos-report¹

- Generating an Sos archive

```
$ sudo sosreport

# Below command is recommended for this demo.
$ sudo sosreport -o ssh,systemd,release
```

4 Specs²

- Raw data in the form of file-content or command output.

```
1 # File
2 $ cat /etc/lsb-release
3 DISTRIB_ID=Ubuntu
4 DISTRIB_RELEASE=18.04
5 DISTRIB_CODENAME=bionic
6 DISTRIB_DESCRIPTION="Ubuntu 18.04.2 LTS"
7
8 # Command
9 $ uname -a
10 Linux foobar 5.0.17-200.fc29.x86_64 #1 SMP Mon May...2019 x86_64...GNU/Linux
```

- Define a Spec

```
1 from insights.specs import Specs
2 from insights.core.spec_factory import simple_file
3
4
5 class SosSpecs(Specs):
6     # sos-report/etc/lsb-release
7     lsb_release = simple_file("etc/lsb-release")
```

5 Parser³

- It structures the raw data(from specs) for further analysis.
- Example(structured data from /etc/lsb-release):

```
{
    'product': 'Ubuntu',
    'version': '18.04'
}
```

- Define a parser

```
1 from insights import Parser, parser
2 from insights.parsers import split_kv_pairs
3
4
5 @parser(SosSpecs.lsb_release)
6 class LsbRelease(Parser):
7     def parse_content(self, content):
8         _content = split_kv_pairs(content)
9         self.data = {
10             'product': _content['DISTRIB_ID'],
11             'version': _content['DISTRIB_RELEASE']
12         }
```

¹<https://github.com/sosreport/sos/wiki#for-users>

²<https://insights-core.readthedocs.io/en/latest/api.html#specification-factories>

³<https://insights-core.readthedocs.io/en/latest/api.html#parsers>

```

13
14     @property
15     def product(self):
16         return self.data['product']
17
18     @property
19     def version(self):
20         return self.data['version']

```

6 Plugin/Rule

6.1 Conditions⁴

- Analyzing the data from the parser

```

1  from insights.core.plugins import condition
2  from insights.parsers.ssh import SshDConfig
3  from insights.parsers.systemd.unitfiles import ListUnits
4  from insights.parsers.redhat_release import RedhatRelease
5
6  @condition(SshDConfig)
7  def check_permit_root_login(sshd):
8      """Return True if 'PermitRootLogin yes' in /etc/ssh/sshd_config.
9      """
10     if sshd.get('permitrootlogin'):
11         return sshd.get_values('permitrootlogin')[0] == 'yes'
12
13
14  @condition(ListUnits)
15  def is_sshd_running(units):
16      """ Return True if 'sshd.service' is running.
17      """
18     return units.is_running('sshd.service') or units.is_running('ssh.service')
19
20
21  @condition([RedhatRelease, LsbRelease])
22  def get_release(redhat_release, lsb_release):
23      """Get the product name.
24
25      RedhatRelease: Data from /etc/redhat-release
26      LsbRelease: Data from /etc/lsb-release
27      """
28     if redhat_release:
29         return redhat_release.product
30     if lsb_release:
31         return lsb_release.product

```

6.2 The response⁵

- The @rule will have a final logic which will decide the response of the plugin.

```

1  from insights.core.plugins import make_fail, make_pass, rule
2
3
4  @rule(check_permit_root_login, is_sshd_running, get_release)
5  def report(root_login, sshd, release):
6     if sshd and release:
7         if root_login:

```

⁴https://insights-core.readthedocs.io/en/latest/api_index.html?highlight=%40condition#insights.core.plugins.condition

⁵<https://insights-core.readthedocs.io/en/latest/api.html?highlight=%40rule#rule-plugins>

```

8         # The issue is detected.
9         return make_fail('SSHD_ROOT_LOGIN_PERMITTED',
10                          os=release)
11     # The issue does not exist.
12     return make_pass('SSHD_ROOT_LOGIN_DISABLED',
13                      os=release)

```

6.3 Embedded content⁶

- Use the CONTENT attribute to render the response

```

1 fail_message = """
2 The root user can login on this {{os}} host because the 'PermitRootLogin' is set
3 to 'yes' in /etc/ssh/sshd_config.
4
5 It is recommended to set 'PermitRootLogin' to 'prohibit-password',
6 'forced-commands-only' or 'no'.
7
8 Please refer the manpage of SSHD_CONFIG for more info:
9 $ man 5 ssh_config
10 """
11
12 pass_message = """
13 The root user cannot login on this {{os}} host.
14 """
15
16 CONTENT = {
17     'SSHD_ROOT_LOGIN_PERMITTED': fail_message,
18     'SSHD_ROOT_LOGIN_DISABLED': pass_message
19 }

```

7 Investigating the sos-report⁷

- Run the plugin against the sos-report using:

```
$ insights-run -p your_plugin.py /path/to/sos-report.tar.xz
```

8 Debugging⁸

- Specs

```

1 $ insights-inspect insights.specs.default.DefaultSpecs.redhat_release sosreport_xxx.tar.xz
2
3 IPython Console Usage Info:
4
5 Enter 'redhat_release.' and tab to get a list of properties
6 Example:
7 In [1]: redhat_release.<property_name>
8 Out[1]: <property value>
9
10 To exit ipython enter 'exit' and hit enter or use 'CTL D'
11
12 Starting IPython Interpreter Now
13
14 In [1]: redhat_release.content
15 Out[1]: ['Fedora release 29 (Twenty Nine)']
16

```

⁶https://insights-core.readthedocs.io/en/latest/embedded_content.html

⁷<https://insights-core.readthedocs.io/en/latest/manpages/insights-run.html>

⁸<https://insights-core.readthedocs.io/en/latest/manpages/insights-inspect.html>

```

17 In [2]: redhat_release.path
18 Out[2]: '/tmp/insights-rdhi53c6/sosreport_fedora_sshd_root_login/etc/redhat-release'
19
20 In [3]: redhat_release.file_name
21 Out[3]: 'redhat-release'

```

- Parser:

```

1 $ insights-inspect insights.parsers.redhat_release.RedhatRelease sosreport_xxx.tar.xz
2
3 IPython Console Usage Info:
4
5 Enter 'RedhatRelease.' and tab to get a list of properties
6 Example:
7 In [1]: RedhatRelease.<property_name>
8 Out[1]: <property value>
9
10 To exit ipython enter 'exit' and hit enter or use 'CTL D'
11
12 Starting IPython Interpreter Now
13
14 In [1]: RedhatRelease.raw
15 Out[1]: 'Fedora release 29 (Twenty Nine)'
16
17 In [2]: RedhatRelease.parsed
18 Out[2]: {'product': 'Fedora', 'version': '29', 'code_name': 'Twenty Nine'}
19
20 In [3]: RedhatRelease.product
21 Out[3]: 'Fedora'
22
23 In [4]: RedhatRelease.version
24 Out[4]: '29'

```

9 End⁹

⁹Made with Love, L^AT_EX and GNU Emacs