Jenkins
User Conference

Orchestrating Your Jenkins Pipelines With Python and Jenkins API

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whoami

Pradeepto Bhattacharya / @pradeepto

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Agenda

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- Why do we need this library?
- Installation
- Library Modules
- Code Examples
- Documentations
- Q & A

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The Motivation

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Why?

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- Sometimes you want more control over how you want run your jobs.
- It is true that you have many plugins to so many things like - copy artifacts, run child jobs etc. No doubt about it.
- But then there are times you have to develop systems or CI pipelines where you need more fine grained control.
- Thanks to the developers of Jenkins, there is an excellent REST API.
- Open source being open source, some good dudes have written a Python library encapsulating the REST API
- This talk is about this library and what can we do with it.

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Installation

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Installation

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- pip install jenkinsapi
- easy_install jenkinsapi
- sudo apt-get install python-jenkinsapi

- Note : There are other similar libraries. I found this one best for all my use cases. It definitely was the most exhaustive.

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Modules and Code

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Main modules

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- Jenkins : The Jenkins instance
- Job(s) : Represents Jenkins jobs.
- User API : Consists of helpful high-level functions
- Build : This module encapsulates the single run of a Jenkins job
- Artifact : Artifacts are created by Jenkins build. This module encapsulates that.
- Node : Encapsulates Jenkins Node

Connect to Jenkins

#jenkinsconf

```
from jenkinsapi.jenkins import Jenkins

def get_jenkins_instance():
    return Jenkins('http://10.10.20.100:8080')
```

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Jobs

#jenkinsconf

```
>>> jenkins = get_jenkins_instance()
>>> jenkins.keys()
>>> ['Beefy Job', 'Simple Job']
>>> jobs = jenkins.get_jobs()
>>> for job in jobs:
...        print job
...
('Beefy Job', <jenkinsapi.job.Job Beefy Job>)
('Simple Job', <jenkinsapi.job.Job Simple Job>)
```

Jobs

```
>>> job = jenkins.get_job('Simple Job')
>>> job.get_description()
'A very simple job'
>>> job.is_enabled()
True
>>> job.is_running()
False
>>> job.get_last_stable_buildnumber()
29
```

Jobs

#jenkinsconf

```
>>> job = jenkins.get_job('Beefy Job')
>>> job.get_last_failed_buildnumber()
3
>>> job.get_last_completed_build()
<jenkinsapi.build.Build Beefy Job #53>
>>> job.invoke()
<jenkinsapi.invocation.Invocation object at 0x7f0f75733050>
>>> job.is_running()
True
```

Jobs

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```
>>> job.get_scm_type()
'git'
>>> job.get_scm_branch()
['*/master']
>>> job.get_scm_url()
['http://github.com/jenkinsci/mesos-plugin']
```

Jobs

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```
>>> job.disable()
>>> job.is_enabled()
False
>>> job.enable()
>>> job.is_enabled()
True
```

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Jobs

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- 'get_first_build', 'get_first_buildnumber', 'get_jenkins_obj', 'get_last_build', 'get_last_buildnumber', 'get_last_completed_build', 'get_last_completed_buildnumber', 'get_last_failed_buildnumber', 'get_last_good_build', 'get_last_good_buildnumber', 'get_last_stable_build', 'get_last_stable_buildnumber', 'get_next_build_number', 'get_params', 'get_params_list', 'get_revision_dict', 'get_scm_branch', 'get_scm_type', 'get_scm_url', 'get_upstream_job_names', 'get_upstream_jobs', 'has_queued_build', 'invoke', 'is_enabled', 'is_queued', 'is_queued_or_running', 'is_running'

User API

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```
from jenkinsapi.api import *
>>> get_latest_build('http://10.10.20.100:8080','Simple Job')
<jenkinsapi.build.Build Simple Job #29>
>>> get_latest_complete_build('http://10.10.20.100:8080','Beefy Job')
<jenkinsapi.build.Build Beefy Job #53>
```

Build

#jenkinsconf

```
>>> build = job.get_build(54)
>>> build.is_running()
True
>>> build.get_revision()
'b0c30d15b4c0ac55d003db7533c00e889f74891e'
>>> build.name
'Beefy Job #57'
>>> build.get_status()
'SUCCESS'
```

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Build

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```
>>> build.get_console()
'Started by user anonymous\nBuilding on master in workspace /var/lib/jenkins/workspace/Beefy Job\n > git rev-parse --is-inside-work-tree # timeout=10\nFetching changes from the remote Git repository\n > git config remote.origin.url http://github.com/jenkinsci/mesos-plugin # timeout=10\nFetching upstream changes from http://github.com/jenkinsci/mesos-plugin\n > git --version # timeout=10\n > git -c core.askpass=true fetch --tags --progress http://github.com/jenkinsci/mesos-plugin +refs/heads/*:refs/remotes/origin/*\n > git rev-parse refs/remotes/origin/master^{commit} # timeout=10\n > git rev-parse refs/remotes/origin/origin/master^{commit} # timeout=10\nChecking out Revision b0c30d15b4c0ac55d003db7533c00e889f74891e (refs/remotes/origin/master)\n > git config core.sparsecheckout # timeout=10\n > git checkout -f b0c30d15b4c0ac55d003db7533c00e889f74891e\n > git rev-list b0c30d15b4c0ac55d003db7533c00e889f74891e # timeout=10\n[Beefy Job] $ /bin/sh -xe /tmp/hudson1394675615697321597.sh\n+ set -x\n+ echo This job takes a lot of time and consumes a lot of resources.\nThis job takes a lot of time and consumes a lot of resources.\n+ which python\n/usr/bin/python\n+ python --version\nPython 2.7.6\n+ sleep 180\n+ echo Done building beefy job.\nDone building beefy job.\nFinished: SUCCESS\n'
```

Build

- 'block', 'block_until_complete', 'buildno', 'get_actions', 'get_artifact_dict', 'get_artifacts', 'get_console', 'get_data', 'get_downstream_builds', 'get_downstream_job_names', 'get_downstream_jobs', 'get_duration', 'get_jenkins_obj', 'get_master_build', 'get_master_build_number', 'get_master_job', 'get_master_job_name', 'get_matrix_runs', 'get_number', 'get_result_url', 'get_resultset', 'get_revision', 'get_revision_branch', 'get_status', 'get_timestamp', 'get_upstream_build', 'get_upstream_build_number', 'get_upstream_job', 'get_upstream_job_name', 'has_resultset', 'is_good', 'is_running'

Artifacts

```
>>> job =  jenkins.get_job('Simple Job')
>>> build = job.get_build(33)
>>> build.get_artifact_dict()
{'artifact.txt': <jenkinsapi.artifact.Artifact http://10.10.20.100:8080/job/Simple%20Job/33/artifact/artifact.txt>}
>>> build.get_artifact_dict()['artifact.txt'].get_data()
'This is artifact\n'
```

Nodes

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```
>>> for node in jenkins.get_nodes().keys():
...               print node
...
master
Big
Small
>>> small.is_online()
True
```

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Plugins

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```
>>> jenkins.get_plugins().keys()
['git-client', 'matrix-auth', 'mesos', 'maven-plugin', 'javadoc', 'external-monitor-job', 'ant', 'ssh-slaves', 'pam-auth', 'windows-slaves', 'git', 'scm-api', 'subversion', 'antisamy-markup-formatter', 'ldap', 'junit', 'mailer', 'credentials', 'translation', 'ssh-credentials', 'matrix-project', 'cvs', 'script-security']
```

Exceptions

- This library comes with bunch of built-in exceptions. I highly recommend you use them in your code and do stuff as you want in case you catch those whilst running your CI pipelines.

- JenkinsAPIException, UnknownJob, UnknownView, UnknownNode, UnknownPlugin, NoBuildData, NoResults ...

Other things you could ...

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- Create Jobs
- Create Views
- Monitor and query builds/jobs/nodes
- Search and manipulate artifacts

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Documentation

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- Some (very few) of the modules are documented.
- There are a few examples in documentation.
- Great opportunity to contribute to this wonderful library.
- https://github.com/salimfadhley/jenkinsapi

Questions?

pradeeptob@gmail.com

Agenda

CloudBees and organisers of JUC Europe 2015
Contributors of Jenkins, Mesos, Mesos plugin
My Family
Kalpak, Shikha, Lenin
Girija and Rupali (my partners in CI related crimes)

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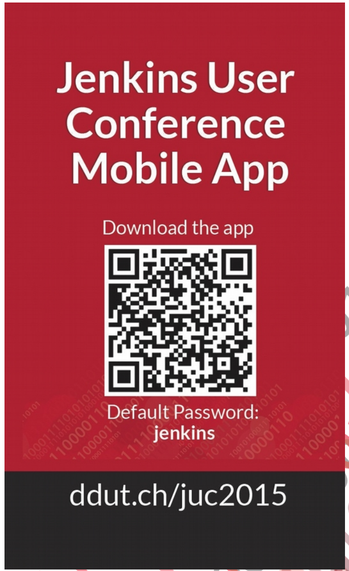
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