Systematic and recomputable comparison of multi-cloud management platforms

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Cloud management platform (CMP)

- Growing needs of multi cloud application and hybrid cloud

  → CMPs gained much popularity

- Many solutions supporting different needs and various of platforms
- CMPs can be:
  - Standalone platform
  - Multi-cloud api library
  - Website based

CMP evaluation

- Evaluation criteria:
  - Time, sec
  - Memory consumption, KB
  - CPU, sec
- One of each type is taken to make proof of concept
- Flexible software:
  - Easy to add new platforms
  - Easy to add new evaluation criteria

Related work

- CloudCom 2015: An Empirical Study for Evaluating the Performance of Jclouds
  - Measuring Jclouds multi-cloud tool kit and compare to native AWS library
  - Download/upload file
- Critical evaluation on Jclouds and Cloudify abstract APIs against EC2, Azure and HP-Cloud
  - Create a prototype tool that will evaluate Jclouds andCloudify

Requirements and approach

- CoMParable CMPs (CMP²) requirements:
  - Comfort
  - Statistical correctness
  - Reproducibility
  - Extensibility
- Set of decorators:
  - Timing
  - Docker consumption
  - Python consumption
  - Tagging

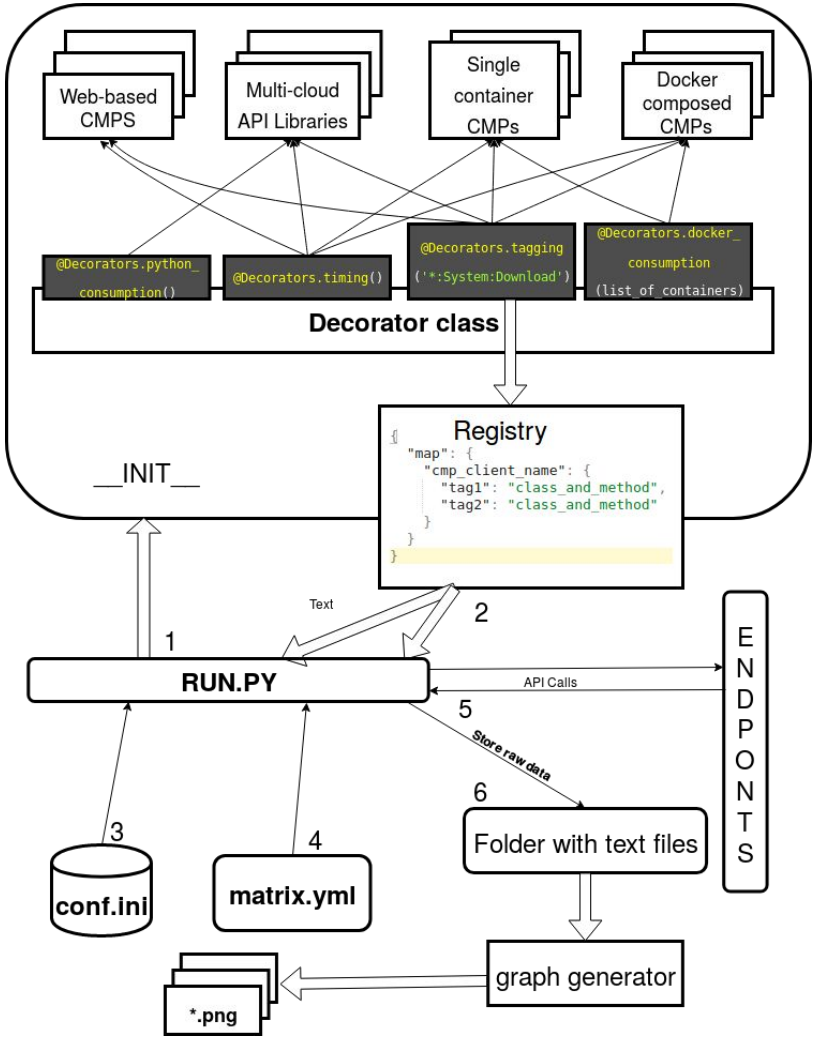
Platforms choice

- Web Platforms:
  - **CloudcheckR**
- Libraries:
  - **Libcloud**
- Containers:
  - Composed Containers:
    - **MistIO**
  - Single Container:
    - **ManageIQ**

Input data

```
mistio:
  repetitions: 50
  output_dir: /home/ubuntu/experiments
  cmps: [mistio]
  providers: [aws]
  pre_experiment:
    system:
      -start
  post_experiment:
    system:
      -stop
  actions:
    provider:
      - create
      - list
      - delete
```

Architecture

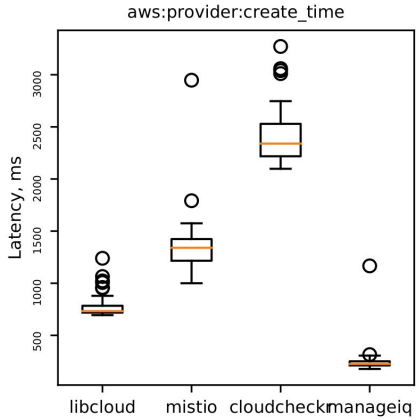


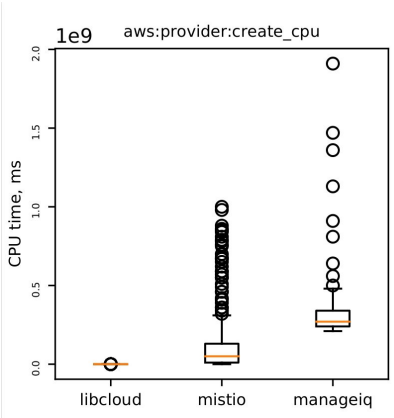
Experimental setup

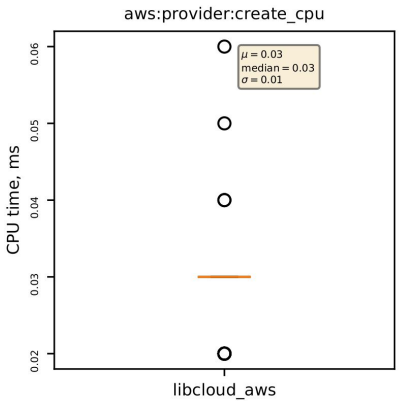
- Hardware
  - RAM: 4 GB
  - VCPUs: 2 vCPUs clocked at 2500 Mhz
  - Disk: 40 GB
  - OS: Ubuntu 16.04.4 LTS
- Software:
  - Mist.io: Cloud Management Platform version: 2.0
  - ManageIQ: gaprindashvili-3
  - CloudcheckR: last update May 21, 2018
  - Apache Libcloud: version 2.3.0

Results

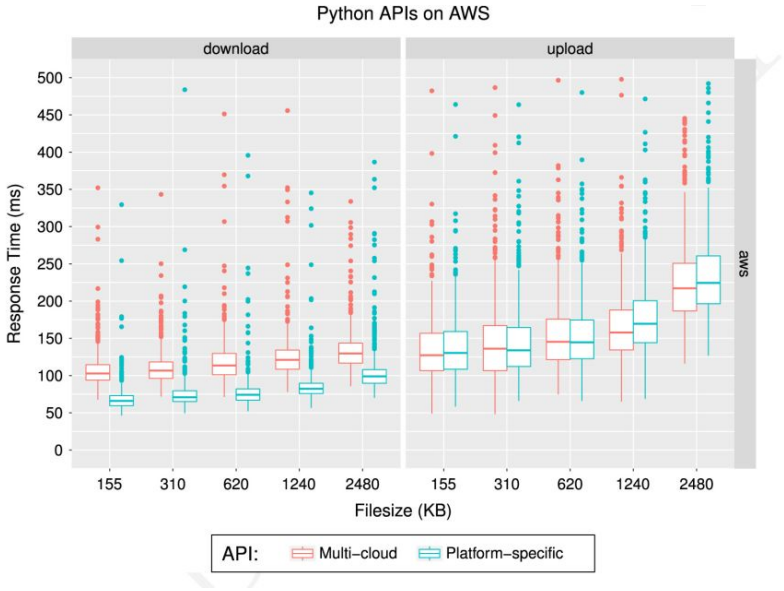
- During this work was developed testbed for CMPs for recomputable experiments
  - Easy to extend
  - Generates graphs and latex table

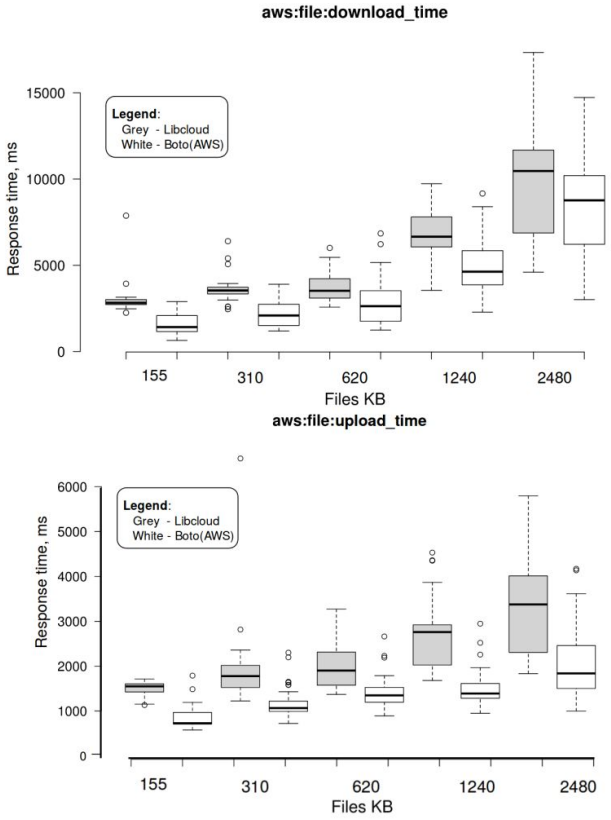






Compare results with related work





“What happened since camera-ready submission“

- Cloudbridge (library)
- Cloudify (docker based)
- Open Source released
- Try it out!

Conclusion

- Test environment and an architecture for multi-platform testing were created
- The architecture is modular and very flexible which provides the possibility of its low-effort expansion.
- All the data and findings are published as open source
- Open data to keep the study reusable and repeatable

one more thing...

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Last-minute registration still possible...

140+ talks

190+ attendees

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