WP5 AI & Safe Autonomous Decision

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WP5T52-04-01: Data version control

WP5T52-04-02: Metadata version control

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Component description

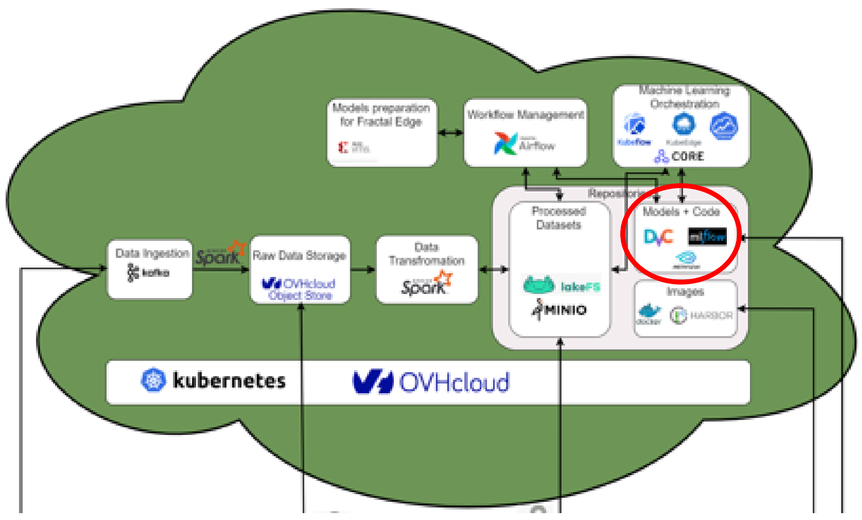
- **Objective of the component:**
  - Get a metadata and data version control for models, datasets, and large files which cannot be tracked by Git.
  - Have full control of the artifacts generated during the ML processes, data science, training, model creation and model validation.

- **Fractal Features associated:**
  - **ADAPTABILITY --> DATA ORCHESTRATION --> DATASET --> STORAGE, VERSION CONTROL**
  - **FRACTALITY --> ORCHESTRATION --> DATA**

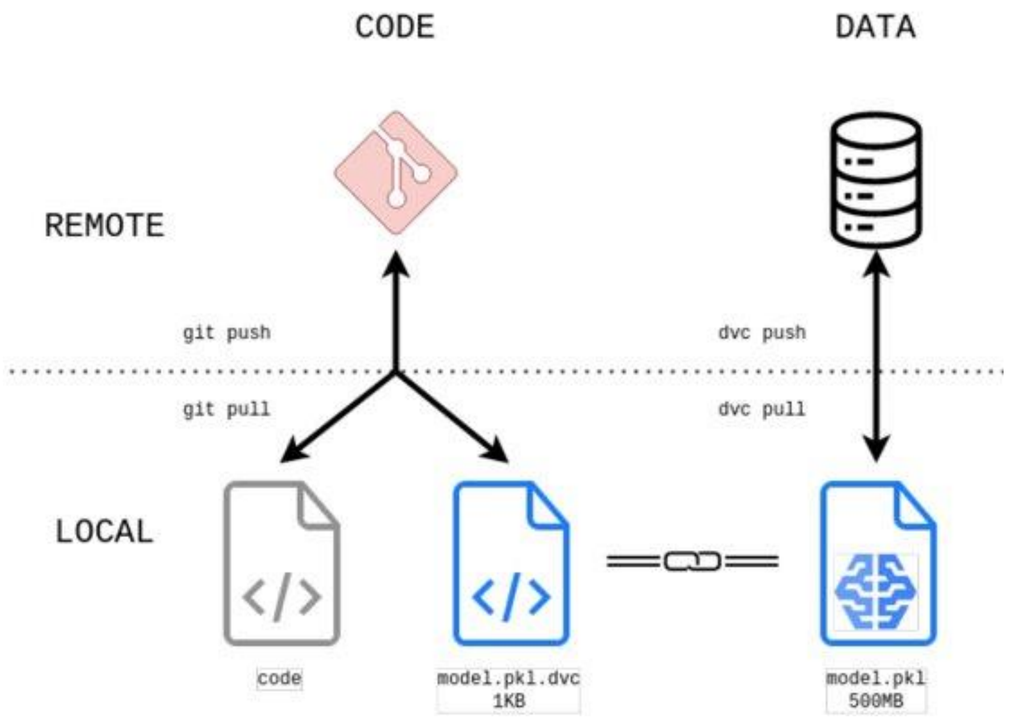
- **Inputs/Outputs:**
  - DVC: CLI commands/Data and large files being version controlled
  - Metaflow: Module usage in Python scripts / Data science projects management

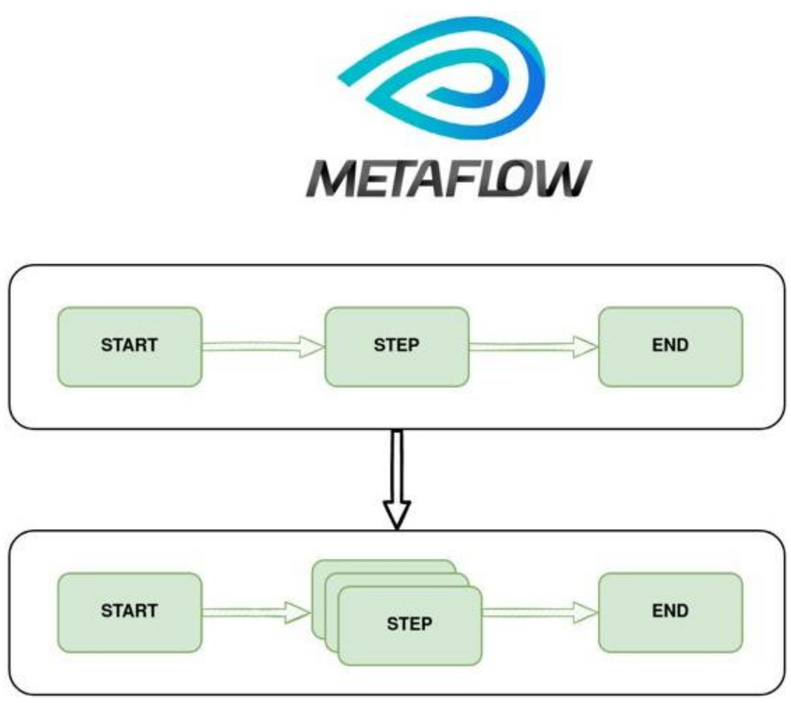
- **Integration:** With which components is or could be connected?
  - DVC: Minio integration for Cloud storage
  - Metaflow: Integrates with any ML Library (Tensorflow, SciKit Learn...) and can be managed from Kubernetes

Component location



Images/Diagrams to describe the component and its processes





Get started

Typical DVC workflow

- Initialize a DVC project in a Git repo with `dvc init` or `dvc exp init`.
- Copy data files or dataset directories for modeling into the project and use `dvc add` to tell DVC to cache and track them.
- Create a simple `dvc.yaml` file to codify a data processing pipeline. It uses your own source code and specifies further data outputs for DVC to control.
- Execute or restore any version of your pipeline using `dvc repro`, or experiment on it with `dvc exp` features.
- Sharing the repository will not include locally cached data. Use remote storage with `dvc push` and `dvc pull` to share data artifacts.

https://dvc.org/doc

```python
from metaflow import FlowSpec, step

class BranchFlow(FlowSpec):

    @step
    def start(self):
        self.next(self.a, self.b)

    @step
    def a(self):
        self.x = 1
        self.next(self.join)

    @step
    def b(self):
        self.x = 2
        self.next(self.join)

    @step
    def join(self, inputs):
        print('a is %s' % inputs.a.x)
        print('b is %s' % inputs.b.x)
        print('total is %d' % sum(input.x for input in inputs))
        self.next(self.end)

    @step
    def end(self):
        pass

if __name__ == '__main__':
    BranchFlow()
```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