

Workflows Interest Group

November 26th, 2020

Workflows

Aims & Scope

- ▶ Foster discussion and knowledge sharing regarding research workflows/pipelines
- ▶ Develop and share best practices for setting up workflows, recommend solutions
 - ▶ Different audiences may require different solutions
- ▶ Create an inventory of workflow systems used in CLARIAH
- ▶ Promote interoperability between CLARIAH tools
 - ▶ More attention for underlying standards and protocols
 - ▶ The details of these are mostly in the scope of the other interest groups on Annotation, Text, Audio/Video, Linked Data.

What is a workflow?

There are various paradigms for workflow systems and various layers of complexity, a simple shell script or Makefile can already be considered a basic form of a workflow.

- ▶ **goal oriented** (GNU Make, luigi, snakemake, Airflow)
- ▶ **procedural** (shell scripts)
- ▶ **data-flow oriented** (Nextflow, SciPipe)

We can also make a distinction on the nature of the software components that are connected; are those local components (local processes) or remote networked components (webservices). Moreover, workflows can be fully automated to require human interaction.

Characteristics

- ▶ **Scheduling:** Determining which sequence of tasks leads to the desired end result
- ▶ **Execution:** Execution of tasks, possibly with automatic parallelisation/abstraction
 - ▶ Abstraction of pipeline logic from execution layer: local execution, computing cluster, cloud platform
- ▶ **Monitoring:** Real-time monitoring of a running workflow and ability to inspect logs on failure
- ▶ **Correction:** Ability to resume the workflow after failure and manual intervention; and/or automated fallbacks
- ▶ **Reproducibility:** Given the same input, the workflow should ideally produce the same output every time
- ▶ **Discovery:** automated discovery of possible workflows
- ▶ **Interaction:** Human intervention (steering/inspection/visualisation) in at specific points in a workflow
- ▶ **Specification:** How are the workflow specified? (languages, abstraction).

Tasks

- ▶ Not really defined yet.
- ▶ Suggestion: Start with an inventory of solutions in use and the needs within CLARIAH.