



European Digital Twin Ocean



Earth Sciences
Department



Barcelona
Supercomputing
Center
Centro Nacional de Supercomputación



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the European Union

Workflow Provenance with RO-Crate in Autosubmit

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Manuel G. Marciani, and Luigi Tenorio Ku

April 15, 2024

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Why?

How?

What?



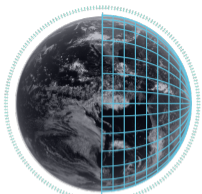
Why we implement provenance?

How did we implement provenance?

What did we achieve?



Why? Digital Twins



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Destination Earth

implemented by

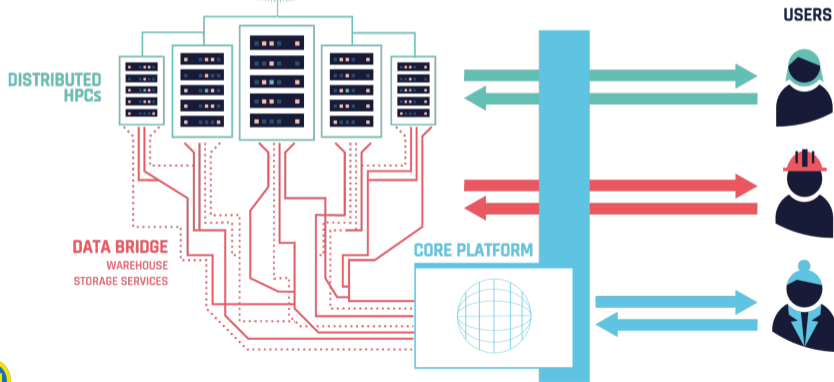


Image courtesy of ECMWF



Why?

Advertisement Break

- Kai Keller, The **Backbone** of the **Destination Earth Climate Adaptation Digital Twin**
- Katherine Grayson, **One-pass Algorithms** for **Streamed Climate Data**
- Francesc Roura, The **Data Streaming** in the **Climate Adaptation Digital Twin**
- Aina Gaya-Àvila, A **Workflow** for the **Climate Digital Twin**



Why?

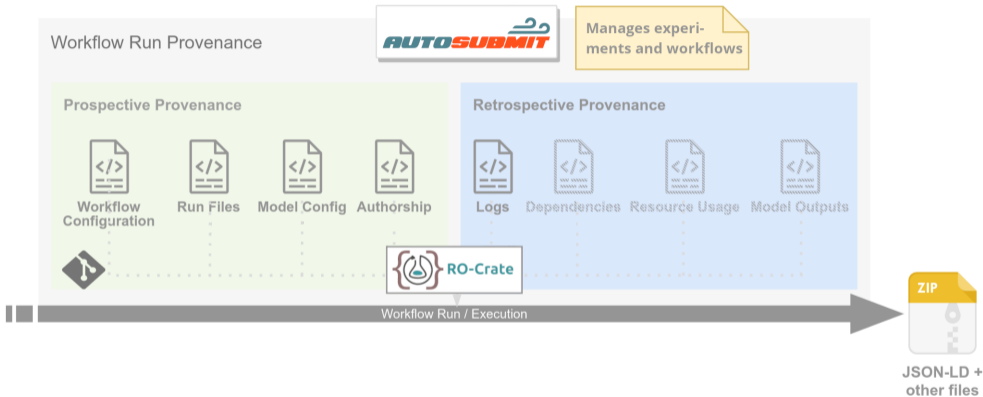
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- Manuel G. Marciani, **Workflows** with **Autosubmit in EDITO**



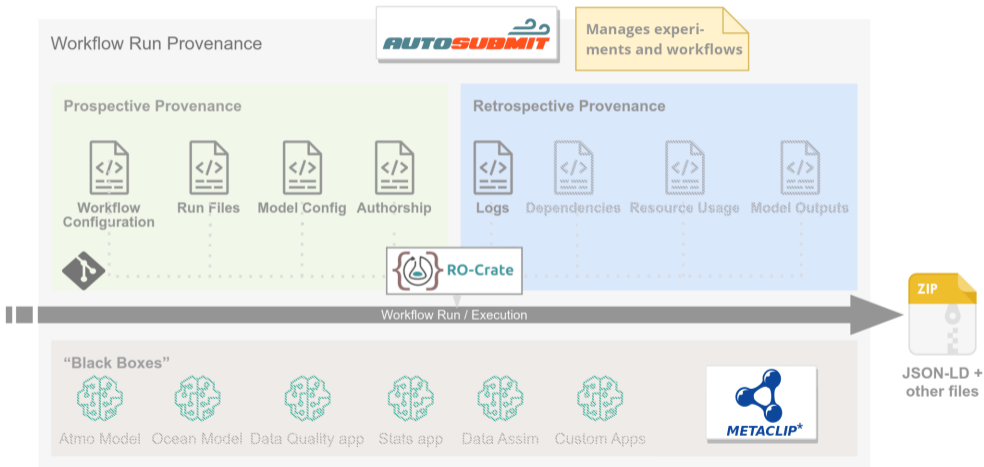
How?

RO-Crate: Digital Object



How?

METACLIP* Integration



*BEDIA, Joaquín, et al. The METACLIP semantic provenance framework for climate products. Environmental modelling & software, 2019, vol. 119, p. 445-457.

What?



Autosubmit mHM test domains

Version 1

 View on GitHub

 Download RO Crate

 Overview

 Files

 Related items

Total size: 1.74 MB

└─  conf

└─  metadata

└─  experiment_data.yml **Main Workflow**

└─  minimal.yml

└─  pkl

└─  plot

└─  proj

└─  status

└─  tmp

└─  ro-crate-metadata.json

└─  ro-crate-preview.html



Preview



domains

Overview

Total size: 1.74 MB

- conf
 - metada
 - exp
 - minimal
 - pkl
 - plot
 - proj
 - status
 - tmp
 - ro-crate-me
 - ro-crate-pre


Path: ro-crate-metadata.json

Size: 40.3 KB

 Download

 Raw

```
{
  "@context": "https://w3id.org/ro/crate/1.1/context",
  "@graph": [
    {
      "@id": "ro-crate-metadata.json",
      "@type": "CreativeWork",
      "about": {
        "@id": "./"
      },
      "author": [
        {
          "@id": "https://orcid.org/0000-0001-8250-4074"
        }
      ],
      "conformsTo": [
        {
          "@id": "https://w3id.org/ro/crate/1.1"
        },
        {
          "@id": "https://w3id.org/workflowhub/workflow-ro-crate/1.0"
        }
      ]
    }
  ]
}
```

 View on GitHub

 Download RO Crate



- BEDIA, Joaquín, et al. The METACLIP semantic provenance framework for climate products. *Environmental modelling & software*, 2019, vol. 119, p. 445-457.
- LEO, Simone, et al. Recording provenance of workflow runs with RO-Crate. *arXiv preprint arXiv:2312.07852*, 2023.
- MANUBENS-GIL, Domingo, et al. Seamless management of ensemble climate prediction experiments on HPC platforms. *En 2016 International Conference on High Performance Computing & Simulation (HPCS)*. IEEE, 2016. p. 895-900.





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Questions?

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Tenorio Ku

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