EUROPEAN SPACE AGENCY

# How Should We Build the Next Generation of Science Platforms?

## Introducing EDACS

The ESA Datalabs and Archives Cloud Study (EDACS) evaluates options for expanding the computing and storage capabilities of ESA Datalabs (EDL) and the ESA Science Archives.

The study focuses on two types of Euclid scientific workloads:

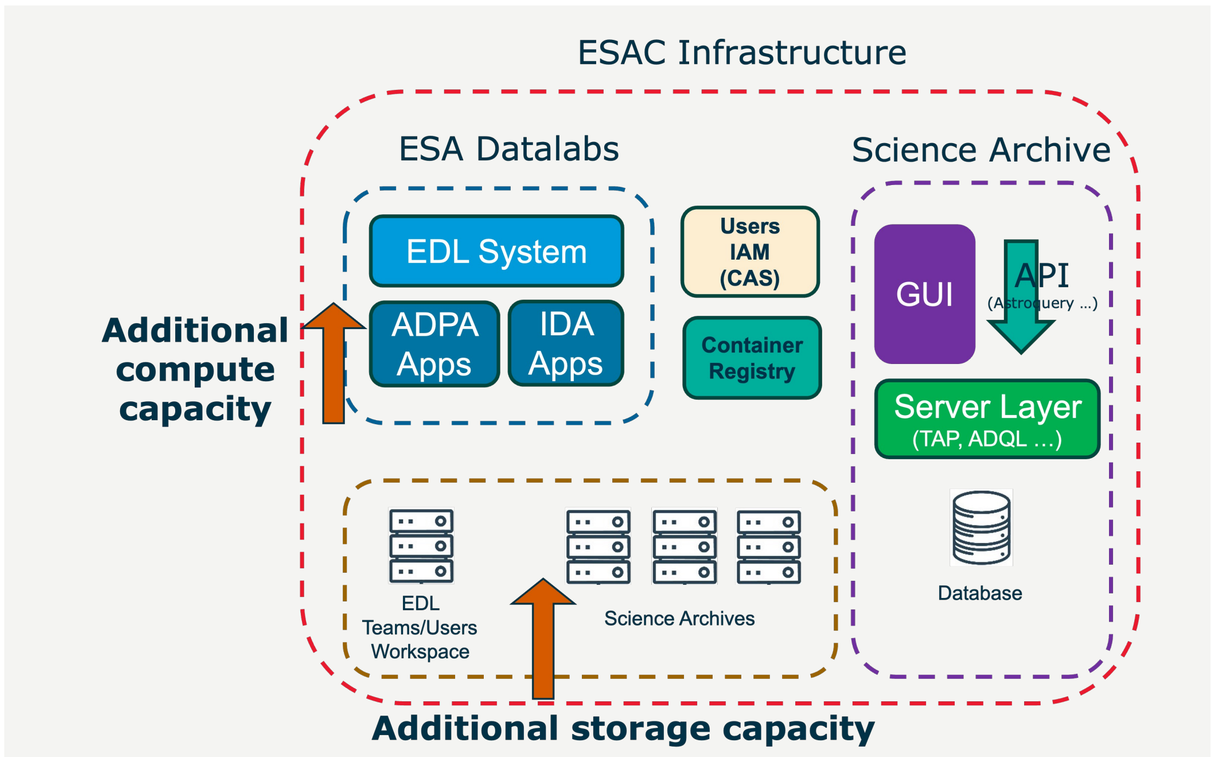
**Interactive Data Analysis (IDA)**
Notebook-based environments for interactive scientific analysis.

**Advanced Data Processing and Analysis (ADPA)**
Large-scale, computationally intensive processing pipelines.

The study compares four expansion scenarios to support these workloads and the required Science Archive services, using the Euclid and Planck archives as representative use cases for the proof of concept. Each scenario will be evaluated in terms of technical feasibility, operational complexity and cost to inform the future expansion of ESA's science platforms.

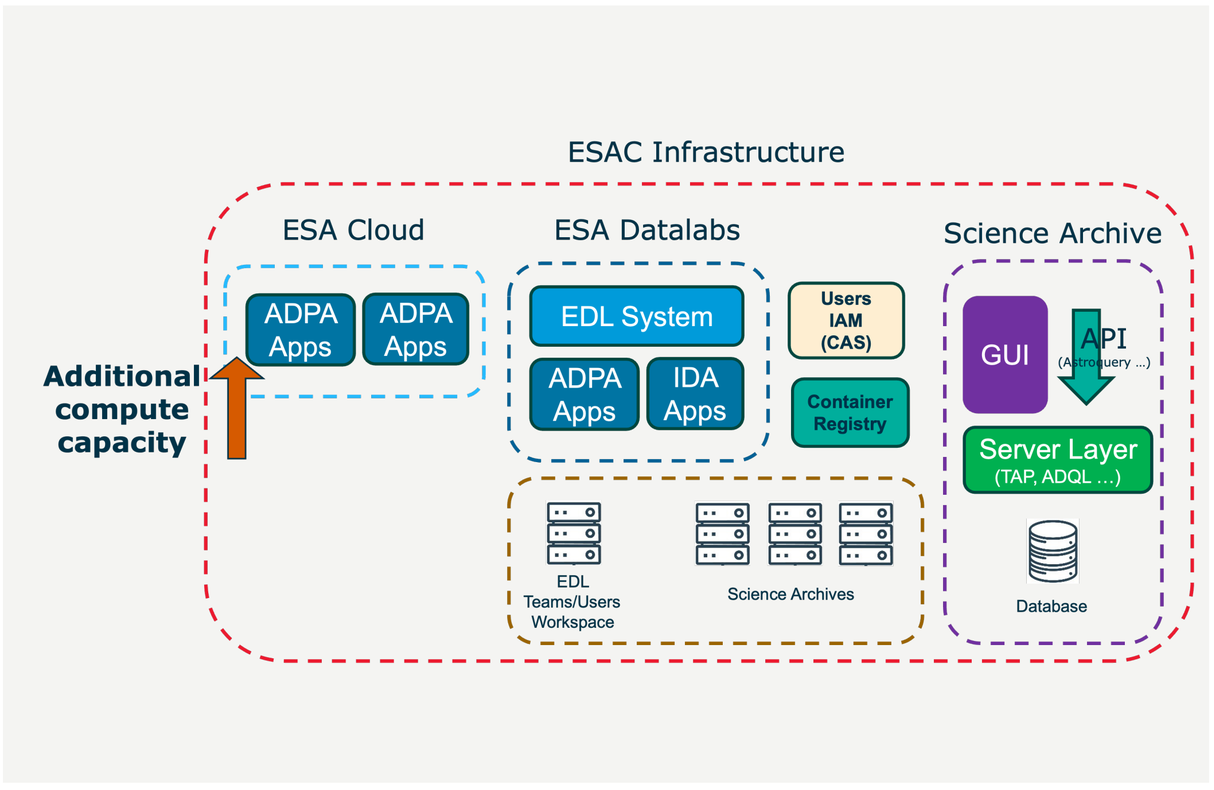
## EDACS Scenarios

### 01 On-premises infrastructure expansion



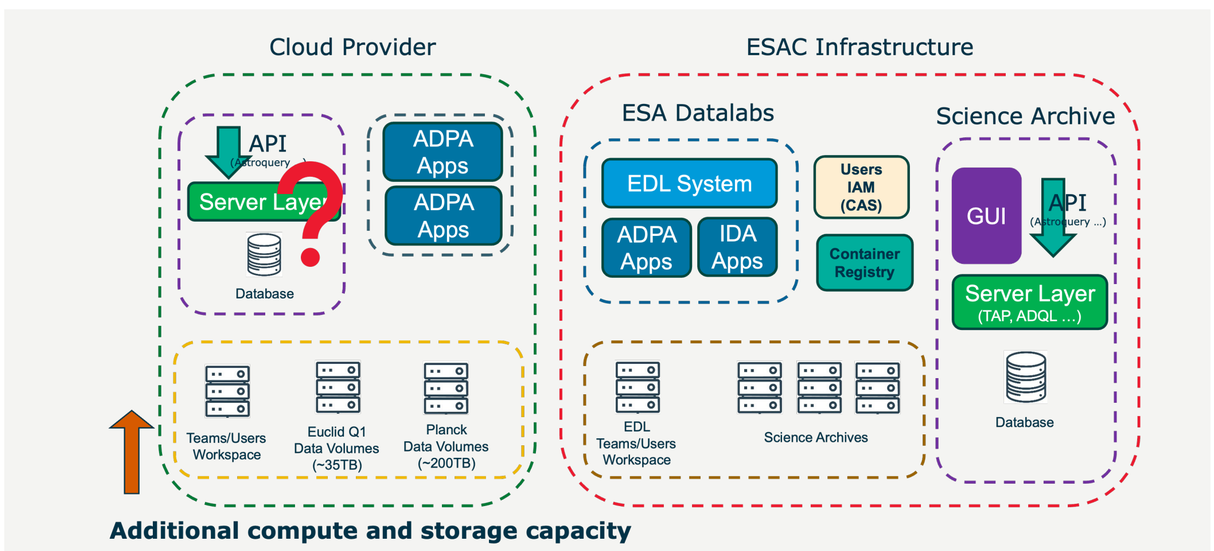

Additional hardware expands the existing infrastructure.

### 02 On-premises expansion using ESA Cloud



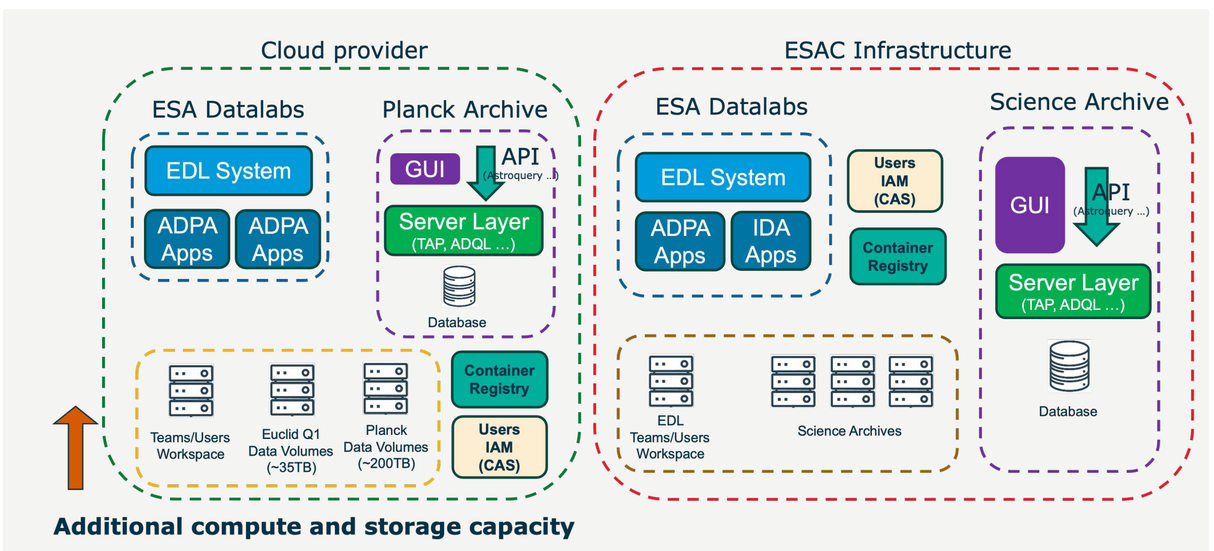

ESA Cloud adds ADPA computing capacity.

### 03 Minimal hybrid cloud deployment




Commercial cloud provides ADPA computing, data storage and the minimum supporting EDL and Archive services required for remote execution.

### 04 Full hybrid cloud deployment




Commercial cloud hosts a second EDL and Planck Archive deployment, including user management and a container registry.

## The Million-Core Questions

**01**
How much of a science platform should move to the cloud?

**02**
How should we schedule workloads across infrastructures?

**03**
When should scientific datasets be replicated, cached or accessed remotely?

**04**
Who pays for cloud resources, and how do we control costs?

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