INTERSECT
EMPOWERING RESEARCH

ARDC
Australian Research Data Commons

AI-Ready Application

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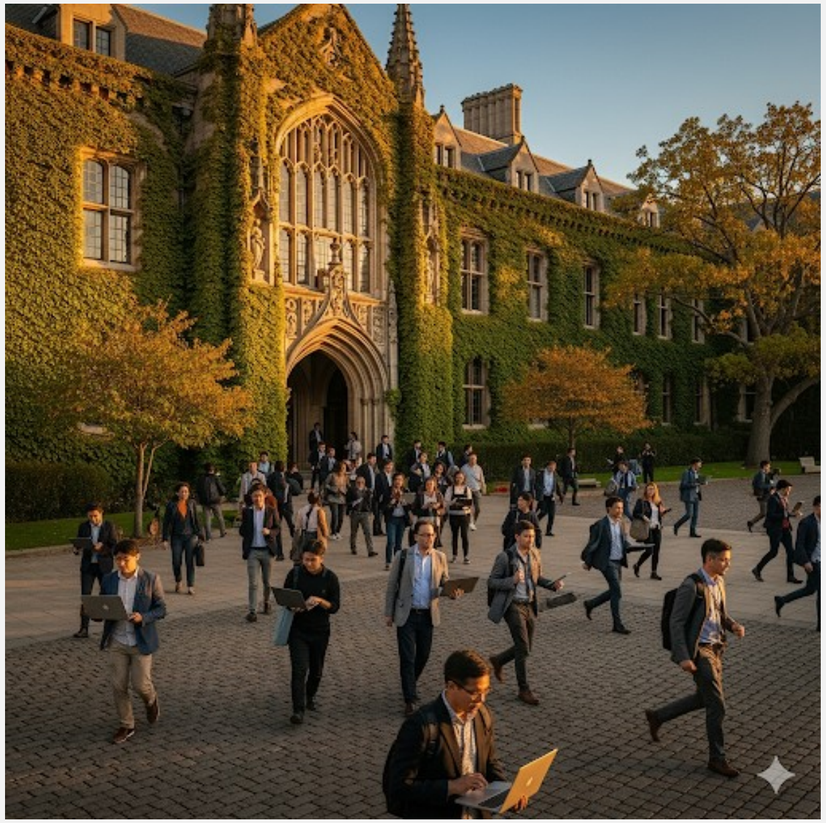
:: Content

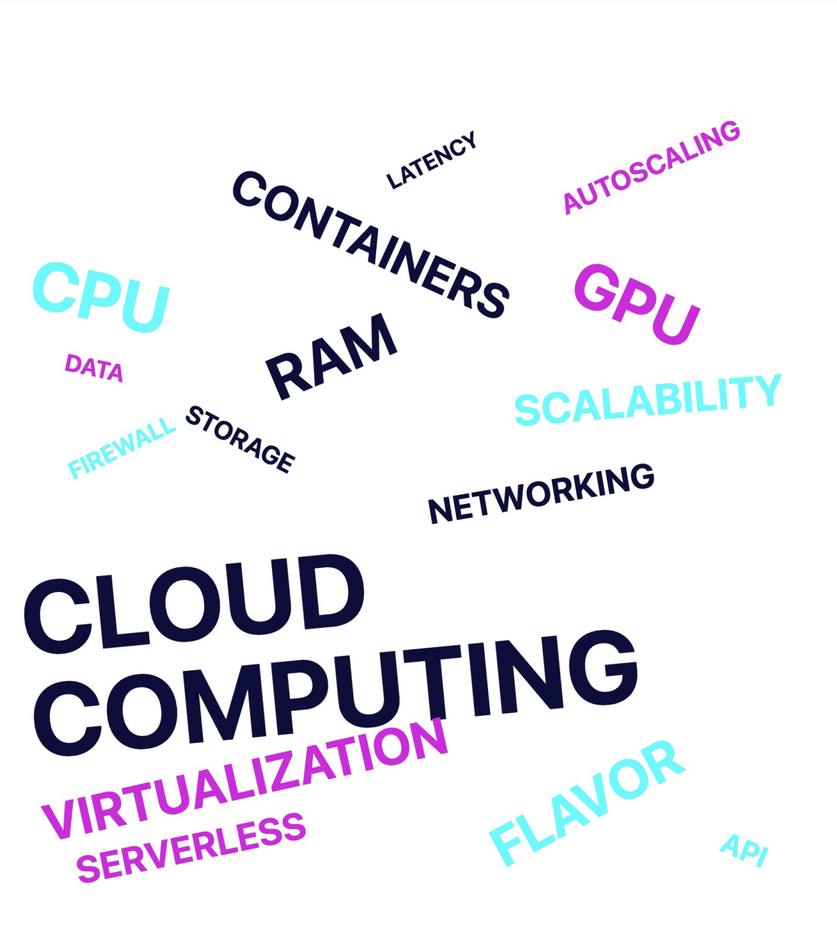
Setting the scene

:: Why use the cloud?



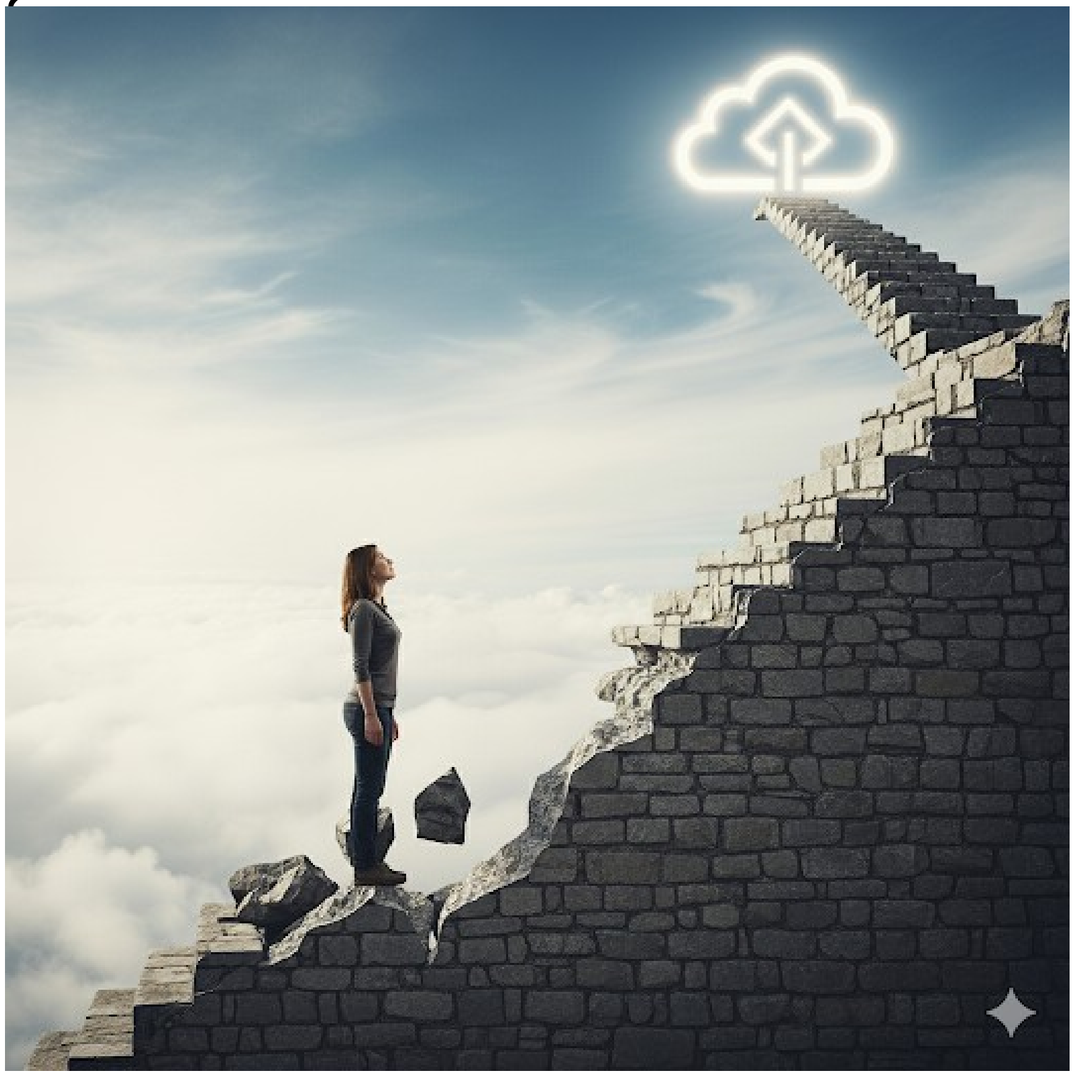
- **More CPUs and RAM:** Cloud computing can offer flavours with more CPUs or RAM than most local computers can offer.
- **Access to high performing GPUs:** Cloud computing like Nectar offers access to high performance GPUs
- **Performance when you need it:** You probably don't need 32 cores and 128GB of RAM when you’re not analysing your data.
- **You’re in control:** We have all experienced that inconvenient forced update that stops our code.

:: Why not?



- **All the lingo:** Computing has a lot of lingo I have already used in the presentation that most researchers don’t need to know.
- **Cost and Complex Pricing:** Cloud computing (especially public cloud) can be confusing and have unknown costs making it difficult to budget for.
- **Data Privacy and Security Concerns:** It may not be appropriate for you to use cloud computing with your dataset or you may not know how to secure it correctly.
- **The knowledge gap:** Researchers are already experts in their specific field or domain, we can’t also expect them to have both expertise in both cloud computing and machine learning.

:: So **where** are we?



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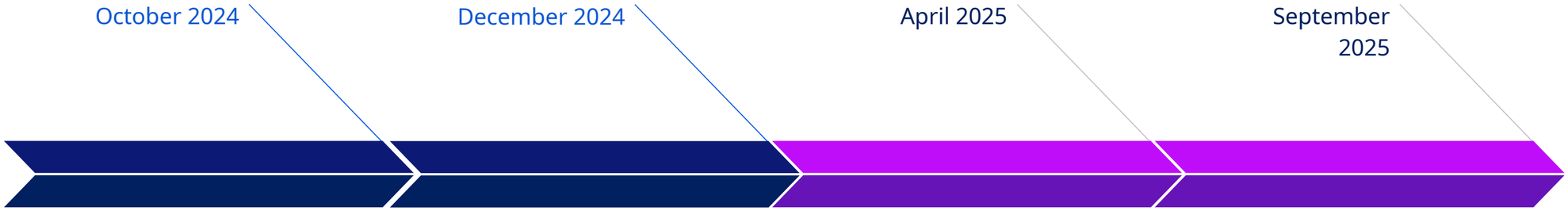
About the application

Ideation to end result



Ideation

3AI and Nectar team identified the gap for researchers and begun to develop project plan.

Conceptualised

The idea and concept was developed and the development of the application was started.

Development Complete

The development of the AI Ready Images was complete and testing initiated with a soft launch on the Nectar console.

Launched

In September, the AI Ready Application was officially launched and advertised by ARDC and Intersect.

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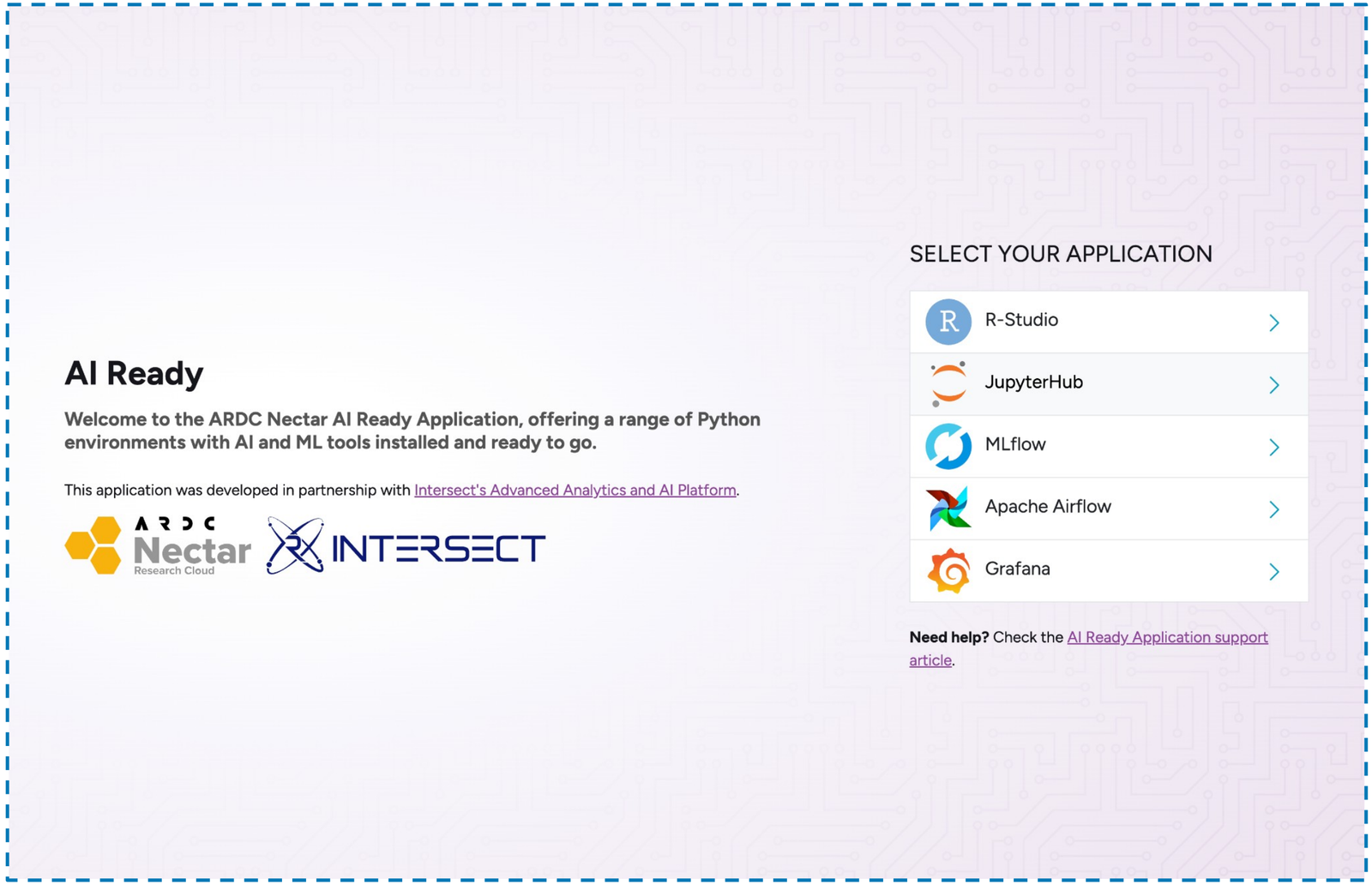
:: How do we solve this?



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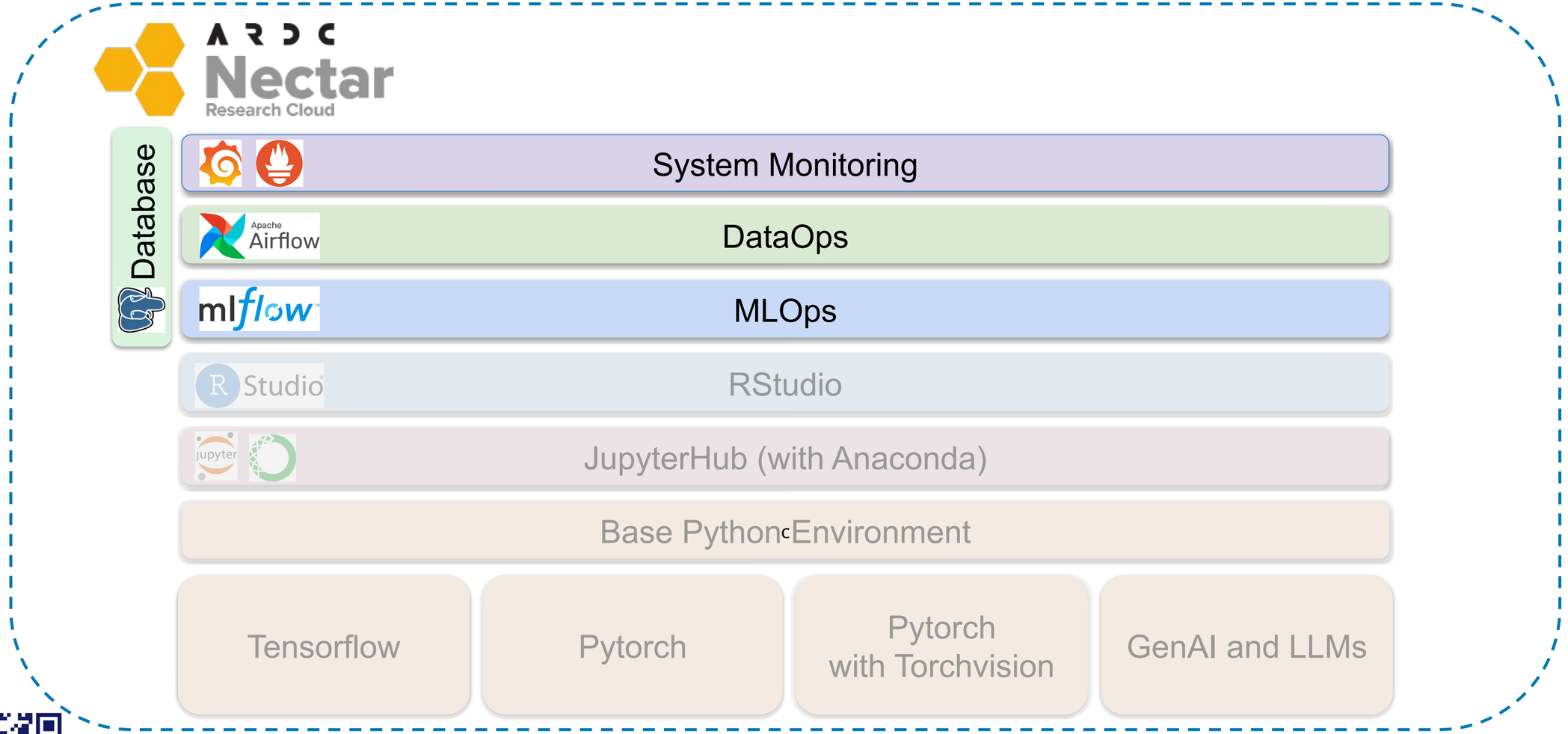


Case Study:
Megadetector Pipeline

:: **Case Study:** Using this tool to create a DataOps/MLOps Pipeline

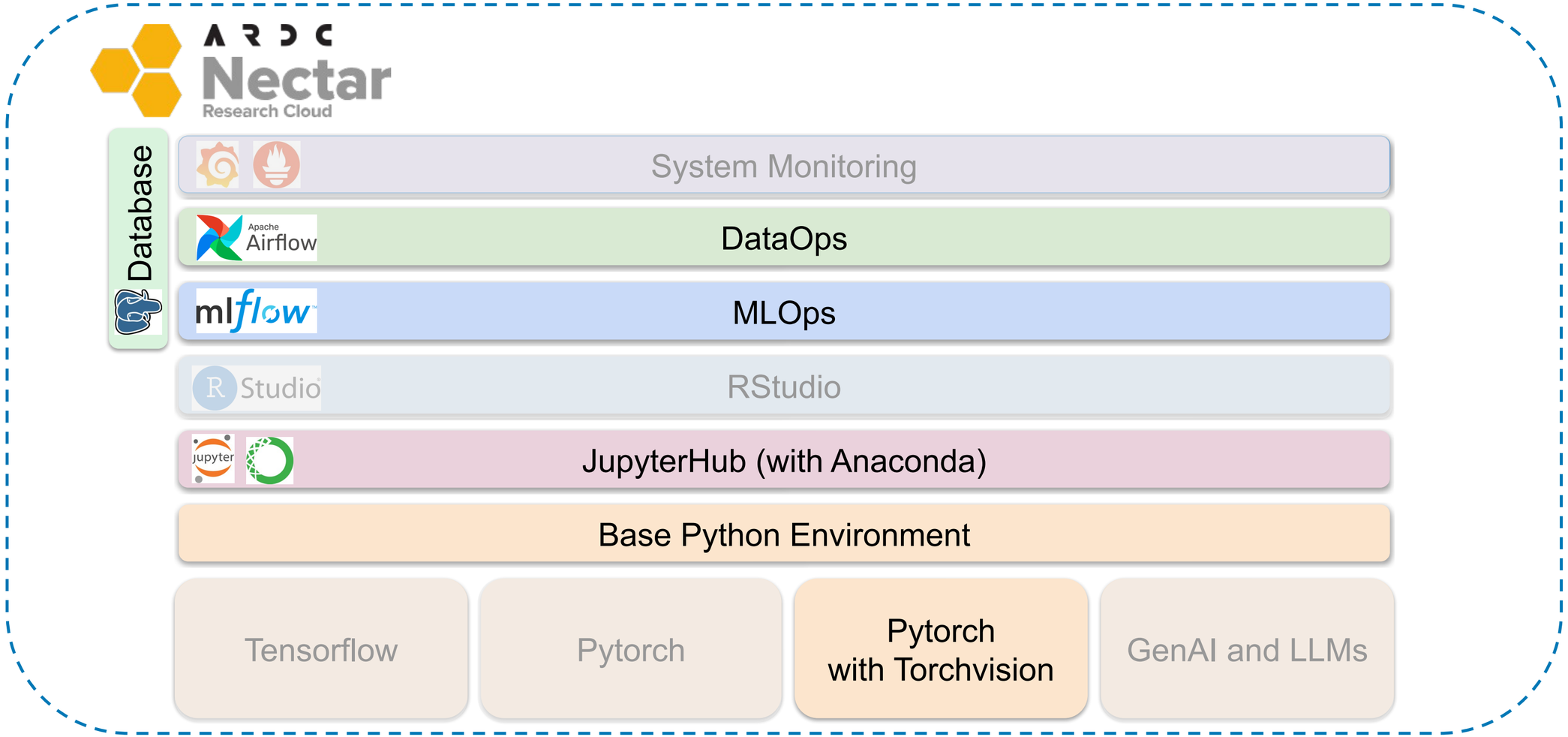
- Researchers upload dataset into volume to SFTP.
- Researchers trigger Airflow DAG to start.

- Tasks to find data within input directory
- Tasks create matching output directories

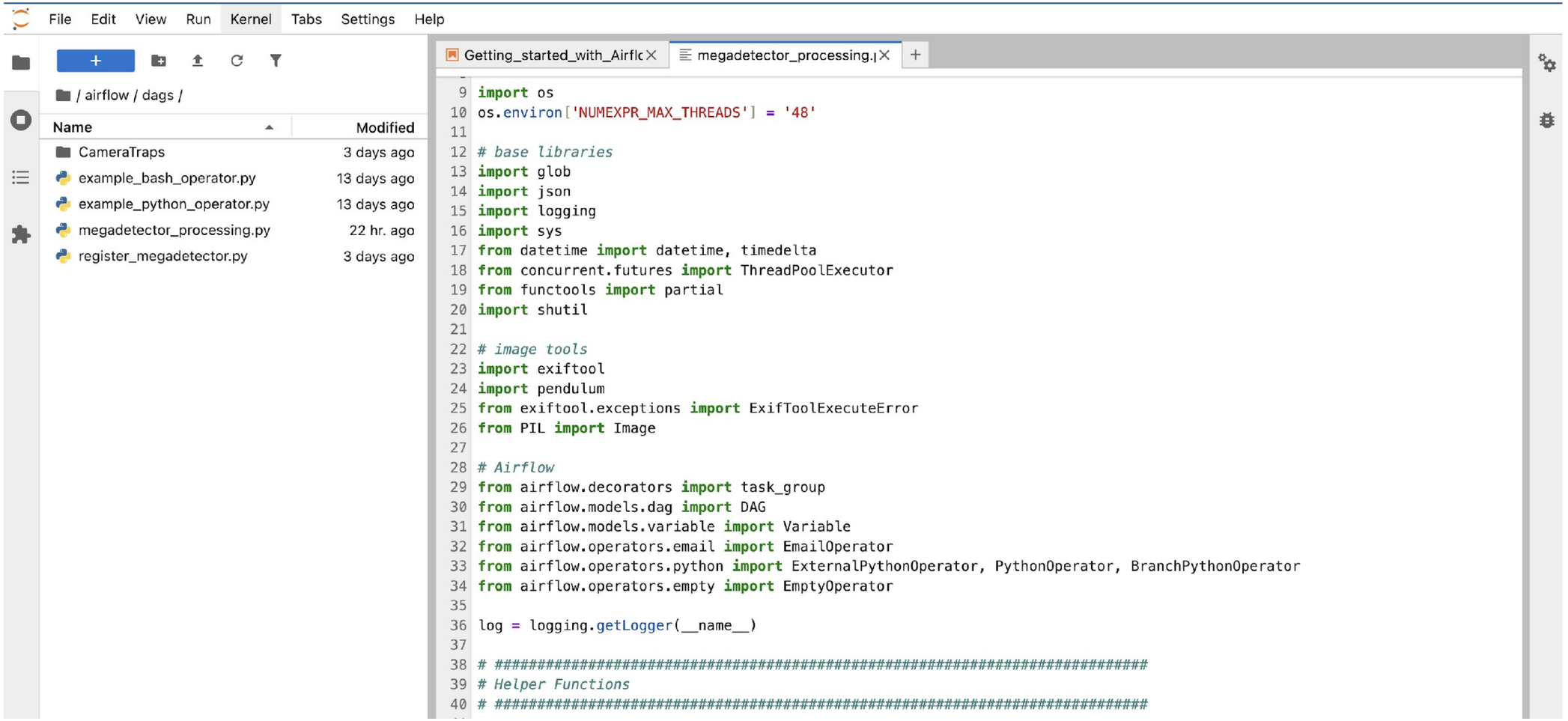
- Task runs object detection algorithm (MegaDetector) to classify images.
- Image metadata is updated.
- Data is sorted into output directories by classification.

- Researchers receive email when dataset is processed.
- Researchers download dataset to local system using SFTP.

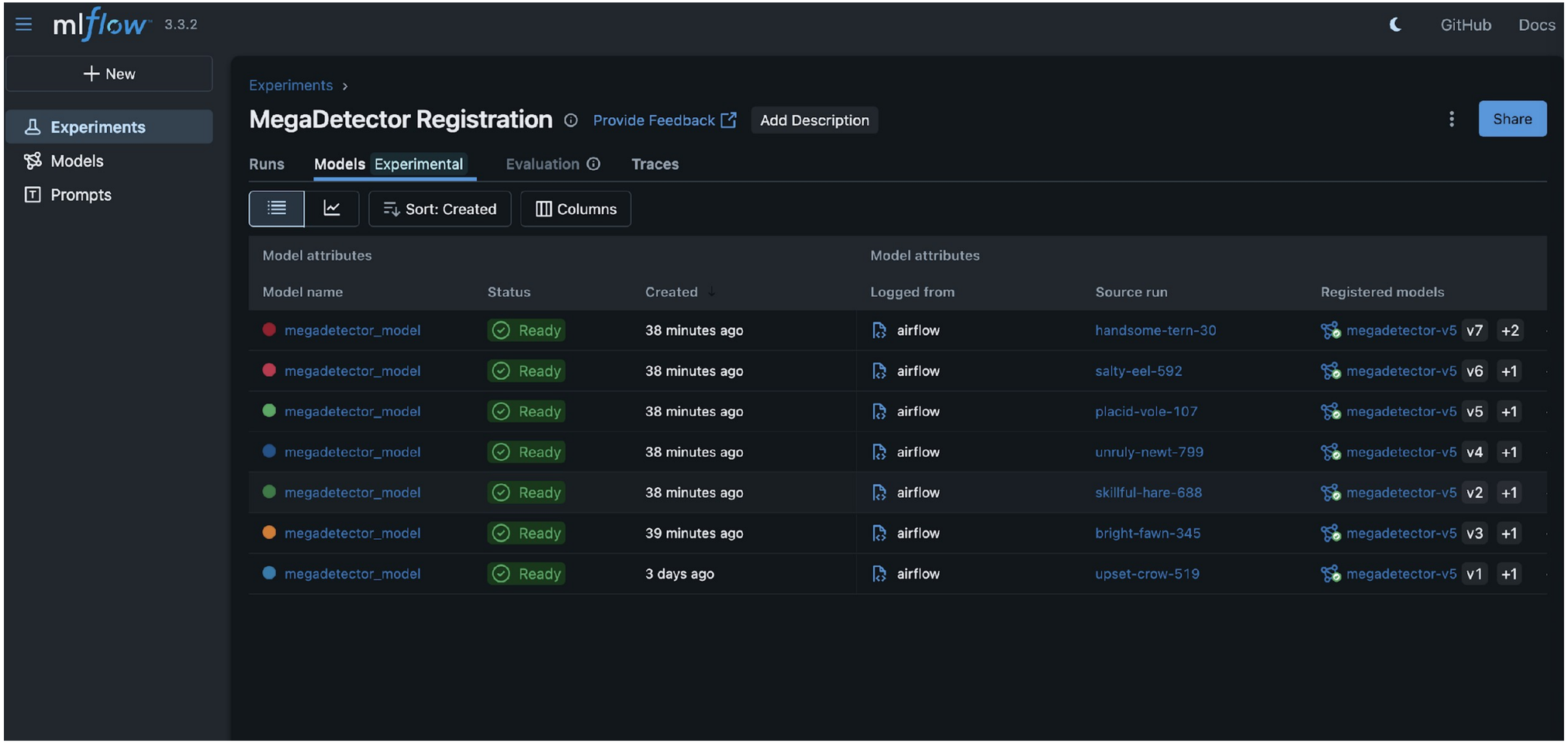
:: **Case Study:** Using this tool to create a DataOps/MLOps Pipeline



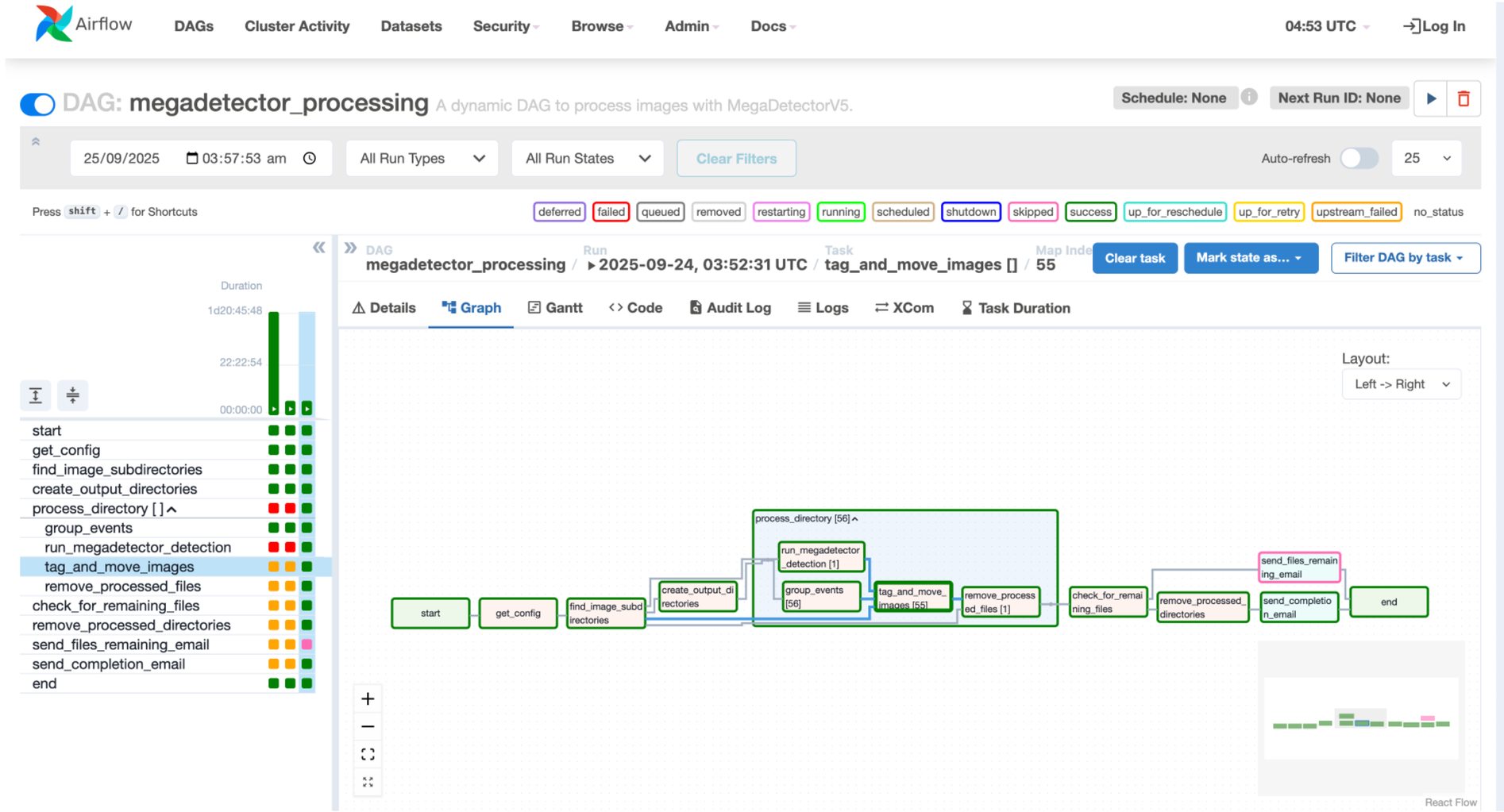
:: Case Study: JupyterHub for Python Development



:: **Case Study:** MLOps for model management



:: **Case Study:** DataOps Pipeline on Airflow



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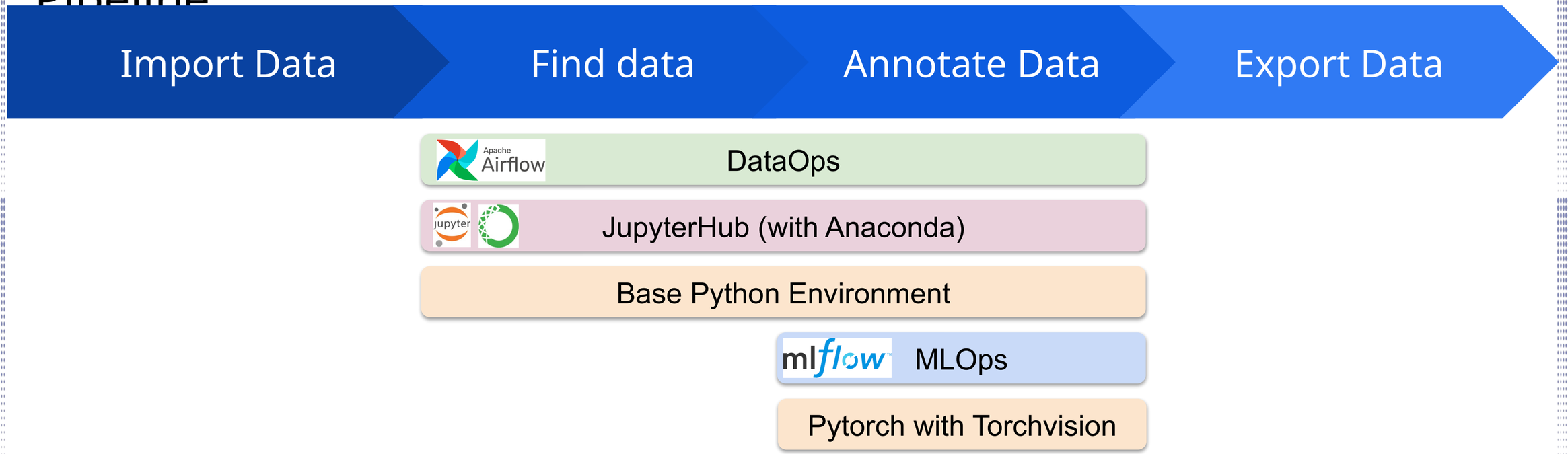
In collaboration with:

NSW GOVERNMENT Department of Primary Industries and Regional Development

une University of New England — Practical Ecology, Science and Technology — PEST RESEARCH

:: **Case Study:** Using this tool to create a DataOps/MLOps Pipeline



Getting started

Australian Research Data Commons

The ARDC is Australia's leading research data infrastructure facility.

- To provide Australian researchers with competitive advantage through data.
- To accelerate research and innovation by driving excellence in the creation, analysis and retention of high-quality data assets.

ARDC Nectar Research Cloud

- Australia's federated national research cloud providing the research community with on-demand computing infrastructure and software.

SELECT PROJECT

nectar-training

Learn more about allocations

RESOURCE BUNDLE

Custom

PROJECT USAGE

2941.29 / 10000 SU

Usage Summary | Limit Summary

Home

Project

Identity

Applications

Allocations

New Request

My Requests

New Allocation Request: About the Project

All My Requests

This form allows you to request a project specific allocation on the Nectar Research Cloud. Allocations take up to 3 weeks to process. If you have any questions please create a support ticket.

NOTE If you would like to request an extension or amendment of an existing allocation, please use the *Amend/Extend allocation* action on the existing allocation request on the My Requests page.

✔ ORCID Connected

0000-0002-5765-6292

Is this ORCID incorrect? Sign out at orcid.org and then go to the My Details page to disconnect.

Before you begin...

Before requesting an allocation, please ensure that you:

- meet the Eligibility Requirements for a national or local allocation
- understand and follow Nectar's Sensitive Data Guidelines
- have an ORCID and it is connected to your Nectar account
- have the Project Information ready
- know the Chief Investigator name and contact details
- can provide the Research Grant information
- know the FoR code to describe the research

INFO: Required fields are marked with an * sign.

STEP 1: About the project | STEP 2: Cloud resources

1. Project Details

Project allocation title *

Contact e-mail

andy.botting@ardc.edu.au

Project Identifier *

Project identifier cannot be changed after allocation is approved.

Generated project DNS zone name

Estimated project duration *

12-months

Convert trial project?

No, start with a blank project.

Step 1 out of 9

Next

2. Usage Information

3. Fields of Research (FOR)

4. Supported Institutions

5. Investigator

6. Project Support

7. Research Grant Information

Help

SELECT PROJECT

nectar-training

Learn more about allocations

RESOURCE BUNDLE

Custom

PROJECT USAGE

2941.29 / 10000 SU

Usage Summary | Limit Summary

Home

Project

Identity

Applications

Browse

Browse Local

Manage

Applications

Allocations

Recent Activity

No recent activity to report at this time.

App Category: All

Environment: quick-env-10

Filter

Filter

AI Ready

Python environment with essential libraries for data analysis, machine learning, and AI development. Ideal for users starting the...

Details »

shared

Add to Env | Quick Deploy

Apache HTTP Server

The Apache HTTP Server Project is an effort to develop and maintain an open-source HTTP server for modern operating systems incl...

Details »

shared

Add to Env | Quick Deploy

Docker Container

The application provides ability to create Docker container to deploy one of the 13,000+ apps available on Docker Hub at https://...

Details »

shared

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Docker HTTPd

The Apache HTTP Server, colloquially called Apache, is a Web server application notable for playing a key role in the initial gro...

Details »

shared

Add to Env | Quick Deploy

Docker Standalone Host

Docker is an open platform for developers and sysadmins to build, ship, and run distributed applications. Consisting of Docker En...

Details »

shared

Add to Env | Quick Deploy

Duply Backups

Simple cloud backups using a Swift container and duply, a frontend for the duplicity incremental archiving tool. Package author e...

Details »

shared

Add to Env | Quick Deploy

Next Page

QUICK LINKS

- Dashboard Home
- Nectar Terms of Service
- Nectar Support
- About Nectar
- ARDC Services for Research
- Contact ARDC

We acknowledge and celebrate the First Australians on whose traditional lands we live and work, and we pay our respects to Elders past, present and emerging.

Help

Configure Application: AI Ready

Environment *

Base Python Environment

- Base Python Environment
- PyTorch
- PyTorch and TorchVision
- TensorFlow
- Generative AI and Large Language Models (LLMs)

environment:

Select the Python environment that best suits your activity. For details, see https://support.ehelp.edu.au/support/solutions/articles/6000280865

Host name

my-ai-app

DNS zone

nectar-training.cloud.edu.au.

Host name:

Specify a string, that will be used in instance hostname and possible DNS entry. Just letters, numbers and hyphens are allowed.

DNS zone:

Select DNS zone if you'd like a DNS entry created for you. A HTTPS certificate will be provisioned for you automatically if you choose a zone.

Instance flavor *

m3.xlarge

Key pair

andy

Availability zone *

intersect

Disk size (GB) *

100

Instance flavor:

Number of Instances 1 + 5 + 0 of 50 used

Number of VCPUs 16 + 13 + 0 of 64 used

Total RAM 32768 + 21,504 + 0 of 655,360 MB used

Select your desired flavor. Consider that application performance will be affected by your choice.

Key pair:

Select the keypair to control access to instances. You can login to the instance using SSH with this keypair after the deployment has completed.

Availability zone:

Select availability zone where the application would be created. If you plan to use a volume for your data, this will need match the Availability Zone...

Show more

Disk size (GB):

Specify disk size in GB which is going to be created from image. The minimum size we allow is 60GB, and can be increased depending on your workload.

Username *

myusername

Password *

••••••••

Confirm password *

••••••••

Username:

Provide a username for the new user account to be created. The username should be lowercase letters and numbers only, and must start with a letter.

Password:

Password must be at least 7 characters and contain both lower and uppercase letters, numbers and special characters, except single quote (').

SELECT PROJECT

ncs-demo

Learn more about allocations

RESOURCE BUNDLE

Powerful

PROJECT USAGE

1349.82 / 8000 SU

Usage Summary | Limit Summary

Home

Project

Identity

Applications

Browse

Manage

Applications

Environments

Allocations

Components | Topology | Deployment History | Latest Deployment Log

Application Components

App category All

Find

shared AI Ready

AI Ready

shared Apache HTTP Server

shared Docker Container

shared Docker HTTPd

shared Docker Standalone Host

Drop Components here

+ Add Component

Displaying 1 item

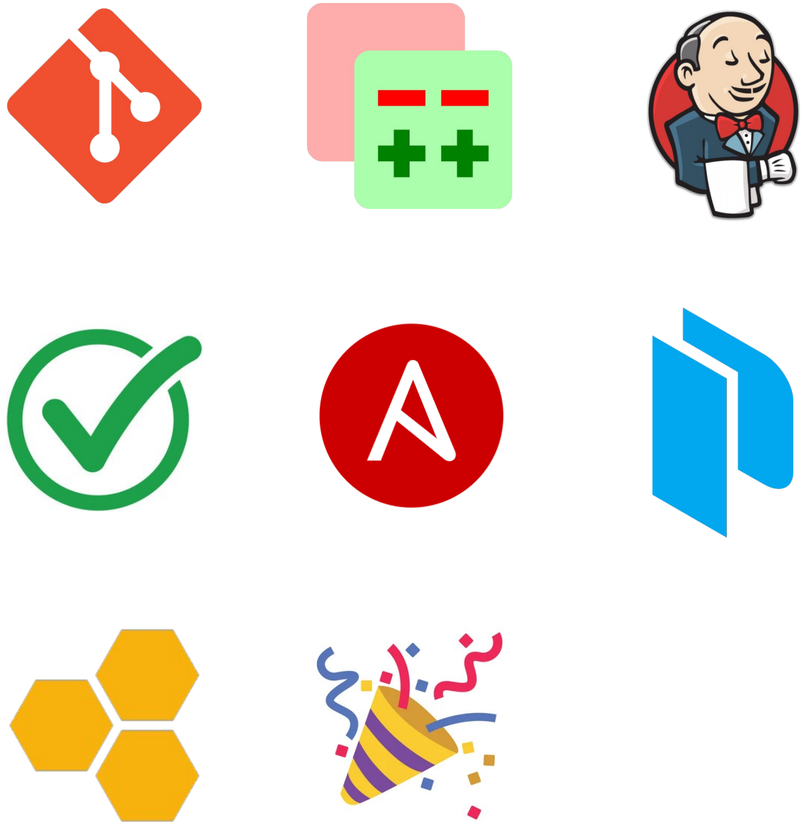
Name	Type	Status	Last operation	Time updated	Actions
AIReady	AI Ready	Ready	Application is available at https://andydemo1.ncs-demo.cloud.edu.au	Sept. 16, 2025, 4:41 p.m.	Delete Component

Displaying 1 item

Help

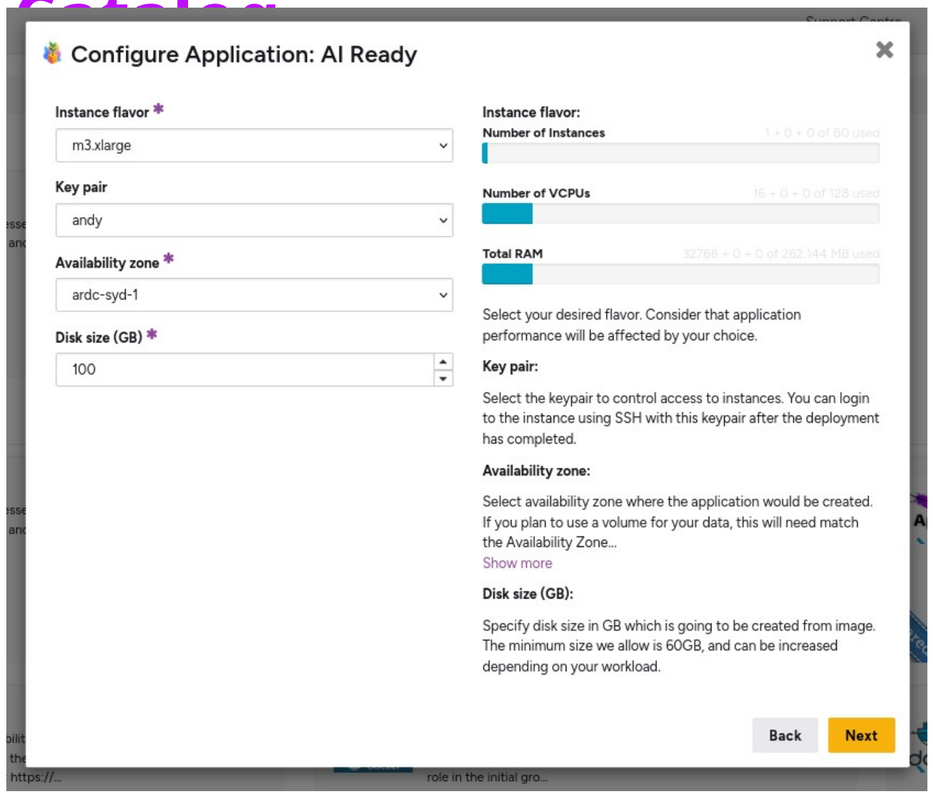
Technical Details

How images are built



- **Changes** proposed to Nectar Code Review service
- Code merged into the **Nectar Images** git repository
- **Jenkins** starts the image pipeline workflow
- **Packer** is used for the image creation process
- **Ansible** is called by Packer to apply the configuration changes including installing packages, deploying configuration files and testing scripts
- Image is uploaded to the Research Cloud **(OpenStack)**
- **Test** scripts are executed to validate the image
- Image is made **public** for general access

:: Nectar Application Catalog



- Cloud Service for deploying applications
- Provides simple interface for user to choose the properties of their environment
- Generates orchestration stack that provisions cloud resources (Virtual machine, Volume storage)
- Boot-time provisioning scripts to handle user provisioning and HTTPS Let's Encrypt certificate

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