



PEPS: CNES ImageAnalysis, On-Premises & in the Cloud with OW2 ProActive

by Erwann Poupart (CNES), Paraita Wohler, Denis Caromel (ActiveEon)

Company



Key information

- ISV Founded in 2007 by Denis Caromel in Sophia-Antipolis, Spin-off of INRIA
- **400 Man-Year R&D Investment**
- 60% of the revenue from international

ProActive Solution

Scheduling
Orchestration
Meta-scheduling
Resource Allocation

On-premises and on All Clouds
Open Source

Partnerships



Global Locations



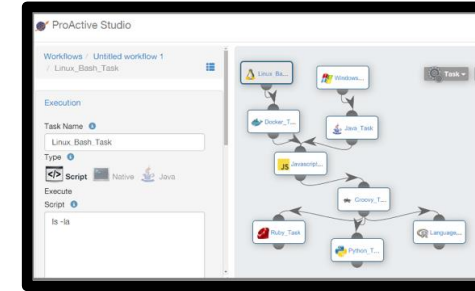
- Sophia-Antipolis (France)
- Paris (France)
- London (United Kingdom)
- San-Jose (United States)
- Montreal (Canada)
- Fribourg (Switzerland)
- Dakar (Senegal)

Next Generation Scheduler/Orchestration **Activeeon** SCALE BEYOND LIMITS

</> Open REST API

Processing and Automation Workflows

<p>Any language</p> 	<p>Secured Data Transfers</p> 	<p>Meta-scheduler</p> 	<p>ETL, ERP, ELT, ...</p> 	<p>Full integration</p> 	<p>Translator</p> 
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Scheduler and Orchestration

Priority & Planning



Parallel Executions







Error Management

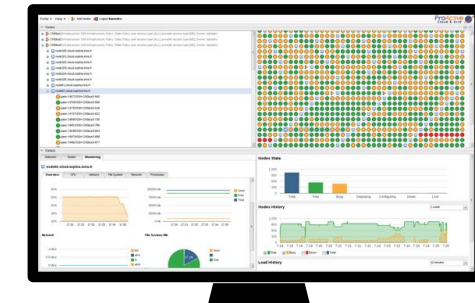


Multi Users



Resource Management and Monitoring

<p>Multi-platform</p> 	<p>Local Machine</p> 	<p>Network Resource</p> 	<p>Batch Scheduler</p> <p>Slurm PBS SGE LSF</p>	<p>Cloud</p> 
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Open Workflow Studio

Workflows

/ IncrementalVaRforEachPortfolioAsset-iVaR

General Parameters

Name

IncrementalVaRforEachPortfolioAsset-iVaR

Project

Finance Workflows

Description

Estimates the incremental VaR (iVaR) for each asset of the portfolio. iVaR quantifies the risk a position (or sub-portfolio) is

Documentation

<http://activeeon.com/resources/montec...>

Job Priority

normal

Workflow Variables

Generic Info

Data Management

Error Handling

Tasks

Unpin

- Linux Bash
- Windows Cmd
- Docker
- Java
- Javascript
- Groovy
- Ruby
- Jython
- Python
- Perl
- PowerShell
- R
- Cron
- LDAP Query

Controls

Unpin

- If
- Loop
- Replicate
- Task Dependencies
- Submit Job No Wait
- Submit Job And Wait
- Wait for Any
- Wait for Any Replicate
- Submit and Wait for Any

Manually

Unpin

- Email Notification
- Web Notification
- Email Validation
- Web Validation

big data

finance

analysis tools

basic-examples

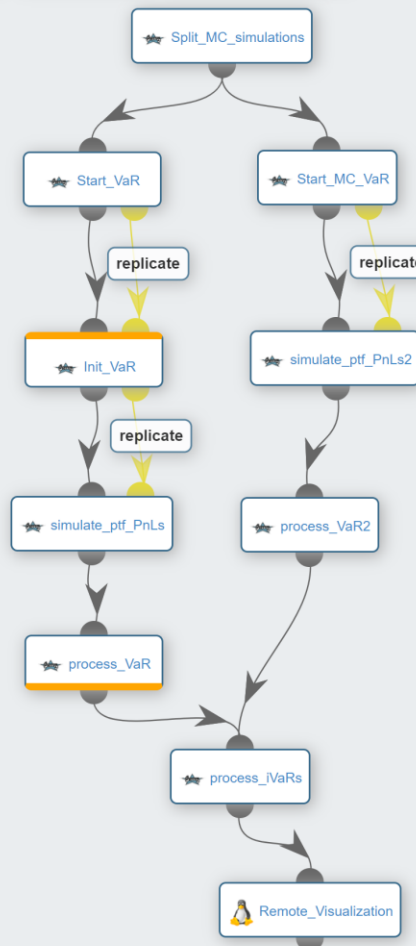
Unpin

Default

- native_task
 - native_task_linux
 - native_task_windows
- ##### 1. Basic Workflows
- pre_post_clean_scripts
 - selection_scripts
 - variables_propagation
 - file_trigger
 - print_file_name
 - 2_minutes_cron
 - start_at
 - start_every_2_min
 - start_every_first_mon_month_12h00

2. Advanced Workflows

- distributed_computing_PI
- mpi_job
- multi_node_task
- data_management
- remote_visualization
- resultmetadata_workflow
- docker_exec_env



Machine Learning Open Studio

ProActive Workflow Studio

MACHINE LEARNING

Azure

Scheduling & Orchestration | Resource Manager | Automation Dashboard | Logout caromel

Workflows / Emotion_Search_In_Bing_Images / BingImageSearch

General Parameters

Task Name: BingImageSearch

Description: This task wraps the Bing Image Search API of Microsoft which provides an experience similar to Bing.com/images

Task Variables (Name, Value, Inherited)

SEARCH_TERM	activeeon	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LICENCE		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IMAGE_TYPE		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COUNT	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OUTPUT_FORMAT	HTML	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MARKET		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Generic Info

TASK_ICON	/automation-dashboa	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Data Management | Error Management | Task Implementation | Pre/Post/Clean scripts | Multi-Node Execution | Node Selection

machine-learning

- 1. Public Datasets
 - Load_Boston_Dataset
 - Load_Iris_Dataset
- 2. Input and Output Data
 - Download_Model
 - Export_Results
 - Import_Data
 - Load_Trained_Model
 - Log_Parser
- 3. Data Preprocessing
 - Add_Data
 - Add_Label
 - Filter_Data
 - Split_Data
- 4. Features Extraction
 - Feature_Vector_Extractor
 - Time_Series_Feature_Extractor
- 5.1 ML Classification
 - Gaussian_Naive_Bayes
 - Logistic_Regression
 - Support_Vector_Machines
- 5.2 ML Regression
 - Bayesian_Ridge_Regression
 - Linear_Regression
 - Support_Vector_Regression
- 5.3 ML Clustering
 - K_Means
 - Mean_Shift

data connectors

- 1. File
 - FTP
 - SFTP
 - URL
- 2. SQL Connectors
 - postgres_connector
 - mysql_connector
 - oracle_connector
 - sql_server_connector
- 3. NoSQL Connectors
 - mongodb_connector
 - cassandra_connector
- 4. Cloud
 - AWS_S3
 - Azure_Storage
- 5. ERP
 - sap_connector

deep learning

- 1. Input and Output
 - Import_Image_Dataset
 - Export_Model
 - Import_Model
 - Import_Text_Dataset
 - Export_Results
- 2. Image Classification
 - AlexNet

Tasks

- 1. Azure Cognitive Services
 - Emotion_Search_In_Bing_Images
 - Sentiment_Analysis_In_Bing_News
- 2. Microsoft Cognitive Toolkit
 - CNTK_ConvNet
- 3. Mixed workflows
 - Sentiment_Analysis_On_Bing_News

azure cognitive-services

- Knowledge
 - Academic_Knowledge
 - Custom_Decision_Service
 - Entity_Linking
 - Knowledge_Exploration_Service
 - QnA_Maker
 - Recommendations
- Language
 - Bing_Spell_Check
 - Language_Understanding
 - Linguistic_Analysis
 - Text_Analytics
 - Translator_Text
 - Web_Language_Model
- Search
 - Bing_Autosuggest
 - Bing_Custom_Search
 - Bing_Entity_Search
 - Bing_Image_Search
 - Bing_News
 - Bing_Video_Search
 - Bing_Web_Search
- Speech
 - Bing_Speech_Service
 - Custom_Speech_Service
 - Speaker_Recognition
 - Translator_Speech
- Vision

machine learning-workflows

- Basic Machine Learning
 - Diabetics_Detection_using_K
 - House_Price_Prediction_using
 - Iris_Flowers_Classification_us
 - Movies_Recommendation
- Image Analysis
 - Keras_Image_Classification
 - PyTorch_Image_Object_Segm
 - PyTorch_Train_Image_Object
 - TensorFlow_Image_Prediction
 - TensorFlow_Parallel_Image_P
 - TensorFlow_Train_Image_Clas
 - YOLO_Image_Anomaly_Deter
 - YOLO_Image_Object_Detectio
- Log Analysis
 - Anomaly_Detection_in_HDFS
 - Anomaly_Detection_in_HDFS
 - Anomaly_Detection_in_Apach
- Machine Learning NodeSource
 - MachineLearning_NodeSource
 - MachineLearning_NodeSource
- Text Analysis
 - One_Hot_Encode_Sequence

Flowchart: BingImageSearch -> Split -> replicate -> Emotion_API -> Merge

<https://www.youtube.com/watch?v=mbrQxCf4lqM>

Cloud Automation: On-demand PaaS



Help ▾

Automation Dashboard

Workflow Studio

Scheduling & Orchestration

Resource Manager

caromel

- Workflow Automation
- Workflow Catalog
- Job Planner
- Cloud Automation
- Notification Service 8

9 Services in catalog

4 Activated Services

2 Transitioning Services

5 Activated Services Today

1 Finished Services Today

4 PCA Running Jobs

6 PCA Total Jobs Today

Activated Services

Instance ID	Service ID	Info	Current state	Actions (Workflow name)	Endpoint list	Kill
2	Visdom		RUNNING	Finish_Visdom ▶	visdom-server-1	
3	Zookeeper		RUNNING	Finish_Zookeeper ▶	zookeeper-server-1	
4	Kafka		VOID → RUNNING ⚡	No possible action	No endpoint	
5	Storm		VOID → RUNNING ⚡	No possible action	No endpoint	

Services and workflows

Service Activation | Full Services View | Service Jobs

Search

Storm Storm VOID→RUNNING

ProActive PCA_example_st... VOID→RUNNING

HDFS-Spark reserve_nodes VOID→PA_NODES_RESERVED

Zookeeper Zookeeper VOID→RUNNING

Kafka Kafka VOID→RUNNING

Visdom Visdom VOID→RUNNING

Finished Services

Instance ID	Service ID	Info	History	Current state	Endpoint list	Clean
1	ProActive			FINISHED	documentation	

On-Demand PaaS Services with full Life-Cycle Management

Help

- Workflow Automation
- Catalog
- Job Planner
- Cloud Automation
- Notification Service 1

17
Services in catalog

3
Activated Services

0
Transitioning Services

38
Activated Services Today

35
Finished Services Today

3
PCA Running Jobs

74
PCA Total Jobs Today

Activated Services

Instance ID	Service ID	Info	Current state	Actions (Workflow name)	Endpoint list	Kill
36	Elasticsearch	i	RUNNING	Finish_Elasticsearch ▶	elasticsearch-server-1	✖
37	Logstash	i	RUNNING	Finish_Logstash ▶	logstash-server-1	✖
38	Kibana	i	RUNNING	Finish_Kibana ▶	kibana-server-1	✖

Finished Services

Instance ID	Service ID	Info	History	Current state	Endpoint list	Clean
1	PostgreSQL	i	↺	KILLED	No endpoint	🗑
2	Elasticsearch	i	↺	FINISHED	elasticsearch-server-1	🗑
3	PostgreSQL	i	↺	KILLED	No endpoint	🗑
4	Logstash	i	↺	FINISHED	logstash-server-1	🗑
5	Kibana	i	↺	FINISHED	kibana-server-1	🗑
6	MySQL	i	↺	FINISHED	mysql-server-1	🗑

Services and workflows

Service Activation
Full Services View
Service Jobs

Storm

Storm
VOID→RUNNING

Kibana

Kibana
STOPPED→RUNNING
VOID→RUNNING

ProActive

PCA_example_start
VOID→RUNNING

H2O

H2O
STOPPED→RUNNING
VOID→RUNNING

HDFS-Spark

reserve_nodes
VOID→PA_NODES_RES
ERVED

PostgreSQL

PostgreSQL
STOPPED→RUNNING
VOID→RUNNING

Clearwater

Clearwater
VOID→RUNNING

Kafka

Kafka
VOID→RUNNING

Openstack

Openstack
VOID→RUNNING

Logstash

Elasticsearch

PCW-action

Catalog

Object Kinds: All

Buckets Show all

basic-examples	1
cloud-automation	47
machine-learning	28
machine-learning-workflows	11
deep-learning	22
deep-learning-workflows	20
h2o	1
elastic-logstash-kibana	15
big-data	16
data-connectors	15
data-visualization	8
database-services	15
finance	7
notifications-tools	4
analysis-tools	3
pcw-rules	2
scripts	2
node-sources	11
calendars	9

Cloud Automation - Deployment Select all

AWS

Clearwater

Elasticsearch

H2O

HDFS

Kafka

Kibana

Logstash

MongoDB

MySQL

Openstack

PostgreSQL

Spark

Storm

Swarm

Visdom

Zookeeper

Spark

Cloud Automation - Lifecycle

AWS_delete

Clearwater_delete

Finish_Elasticsearch

Finish_H2O

Finish_Kafka

Finish_Kibana

Workflow Name : AWS

Description : Deployment of an AWS VM.

Project Name : Cloud Automation - Deployment

Bucket Name : cloud-automation

Latest Update:2018-06-15T09:00:58.91

Default Variables:

















infrastructure_name	PrivateCloud
instance_image	eu-west-1/ami-31328842
instance_name	instance_name

Generic Info:

bucketName	cloud-automation
group	public-objects
pca.service.id	AWS
pca.states	(VOID,RUNNING)
workflow.icon	/automation-dashboard/styles/patterns/img/wf-icons/amazon.png

Some Supported Languages and Connectors




Machine Learning & Artificial Intelligence

 Cognitive Services	 CNTK	 Keras	 PyTorch	 TensorFlow	 Scikit-Learn	 MXNet	 YOLO	 H2O	 Caffe	 Spark MLlib	 Pandas	 JupyterLab	 DeepLearning G4J	 DLib	 BigDL
---	---	--	--	---	---	---	---	--	--	--	---	---	---	---	--

Big Data

 Zookeeper	 Kafka	 Azure Databricks	 Spark	 Hadoop HDFS	 Hadoop	 Swarm	 Storm	 Clearwater	 Twitter
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Specialized

 Cuda	 Open/CL	 FPGA
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Visualization

 Visdom	 Grafana	 Kibana
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Data Connectors

 URL	 FTP	 SFTP	 PostgreSQL	 Greenplum	 MySQL	 Oracle	 SQL Server	 MongoDB	 Cassandra	 Azure Storage	 Azure Data Lake	 AWS-S3	 SAP	 ElasticSearch	 Logstash
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Languages and Predefined Tasks

 Linux Bash	 Cmd	 Java	 Scala	 Javascript	 Groovy	 Ruby	 Jython	 Python	 Perle	 PHP	 PowerShell	 C++/C#	 R	 Cron	 LDAP
---	--	---	--	---	---	---	---	---	--	--	---	---	--	---	---

Infrastructure

 Linux	 Windows	 Solaris	 AIX AS/400	 VMware	 Openstack
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Clouds

 Google Cloud Platform GCP	 Docker	 Kubernetes	 OpenShift
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HPC Schedulers

 Slurm	 PBS Works	 LSF	 SGE
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**The Centre national
d'études spatiales (CNES)**

Data Processing at CNES

Numerical simulation

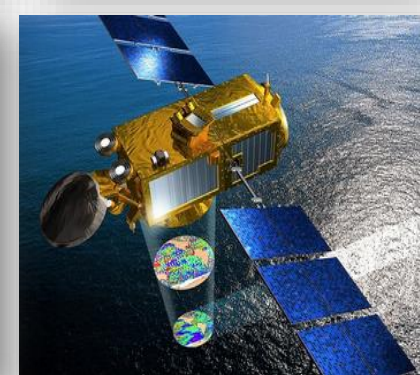
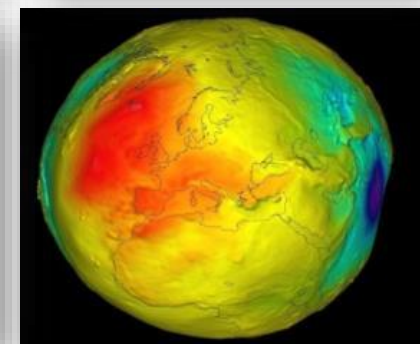
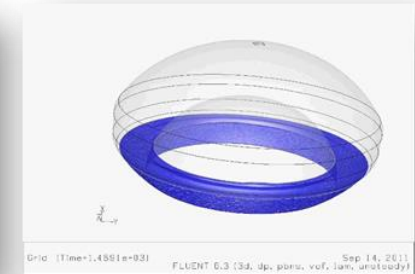
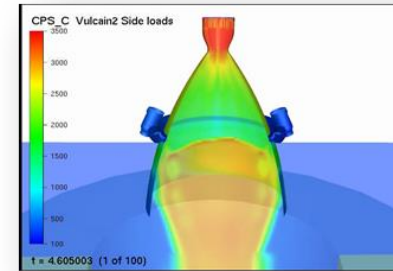
- Research, early phases of missions
- Computation profile mostly HPC centers
- CPU intensive
- Memory bandwidth intensive
- Highly parallel (MPI / OpenMP / CUDA)

On many cores: **8 000 currently**

Data processing (HTC)

- Very common to space engineering
- Process satellite raw data into scientific data
- CPU intensive
- Mostly IO centric application
- Coarse grain parallelism (multiple sequential jobs)

On spark, dask, etc.





PEPS Project

by  **cn**es





PEPS: Plateforme d'Exploitation des Produits Sentinel

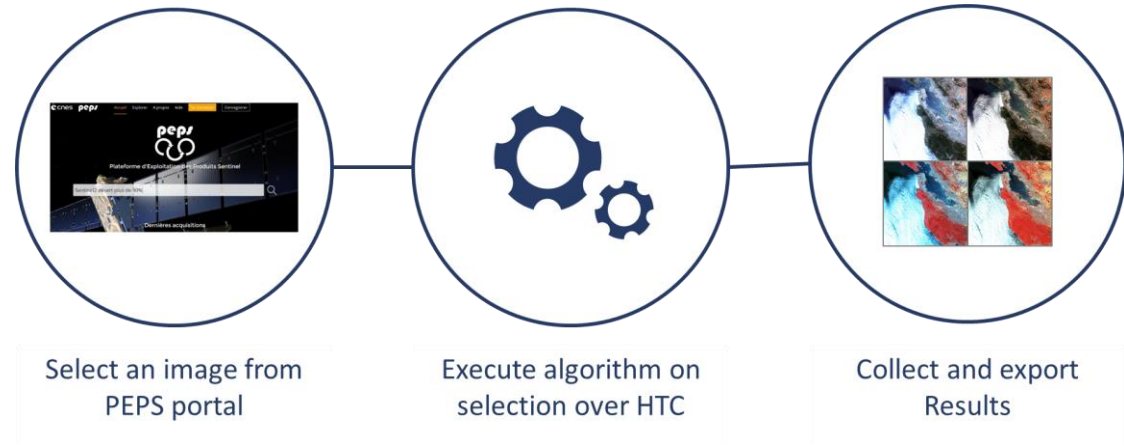
Redistribute for free the products of Sentinel satellites, S1A, S1B, S2A and S2B, S3A and S3B from COPERNICUS, the European system for the Earth monitoring.

Multi-sensor (radar, optical, etc.), High frequency, long term project.

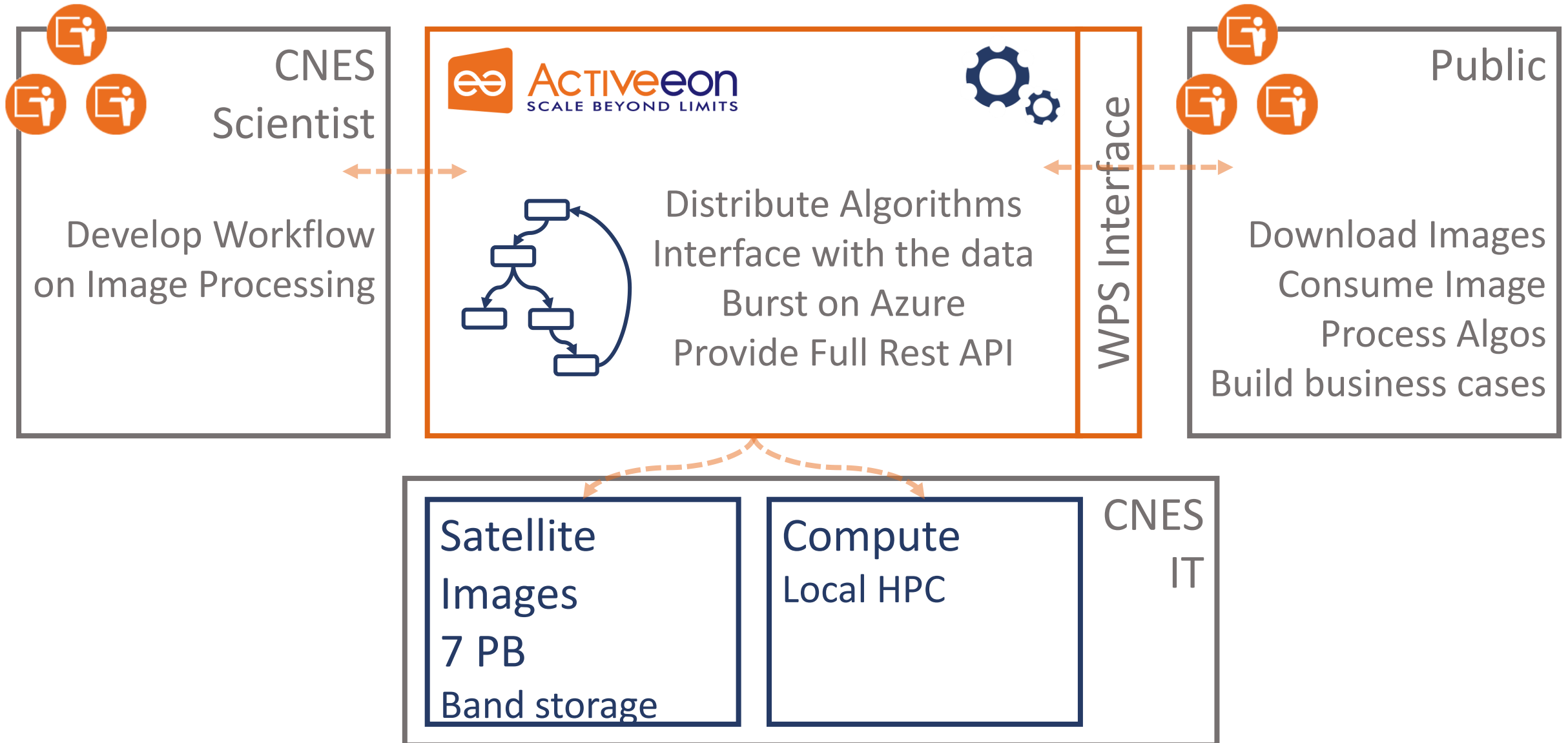
1 PB in 20 years and 7 PB in 2 years! 10 TB/day

Leverage Cloud Capacity: On-premises to Cloud Burst

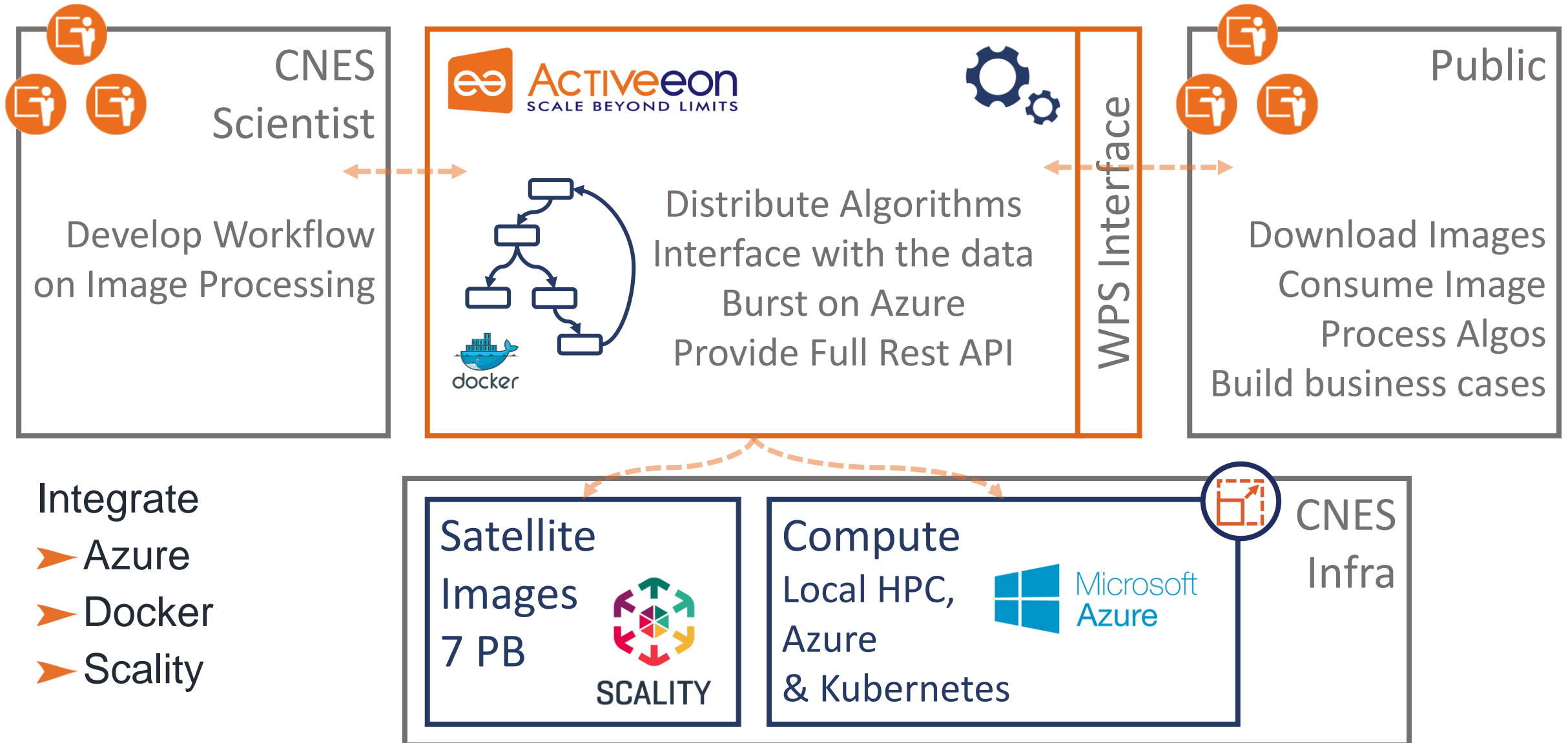
Objectives



PEPS Architecture



PEPS PoC ecosystem architecture





demo
by  cnes

Image Processing Workflow

Workflows / ORTHO_S1_GRD_CLOUD

General Parameters

Name

ORTHO_S1_GRD_CLOUD

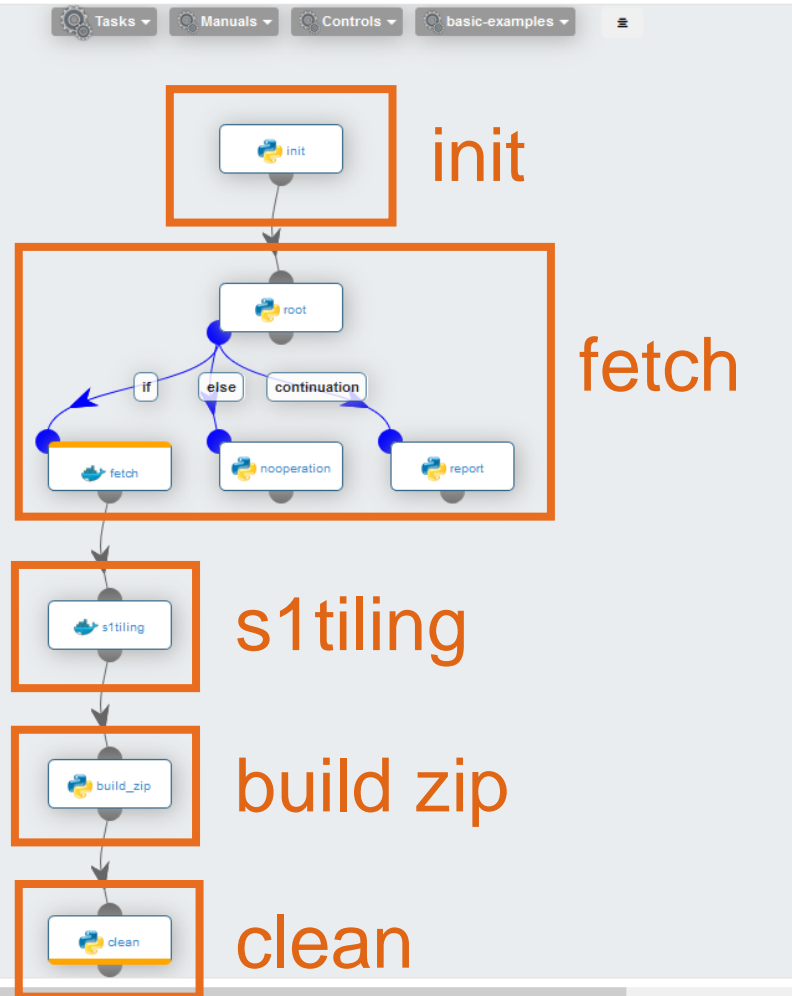
Each task is self healing and check if processing has already been made

Workflow Variables

Generic Info

Data Management

Error Handling



init

Initialize folders and variables

fetch

Fetch data : how and with which parameters according to variables

s1tiling

Image processing over 8 CPU cores
Algorithm on Docker container

Build zip

Compress output

Clean

Demo

0. Prepare Azure Resources with ScaleSet, 10 VMs with each 32 CPU cores



1. Fetch data from portal



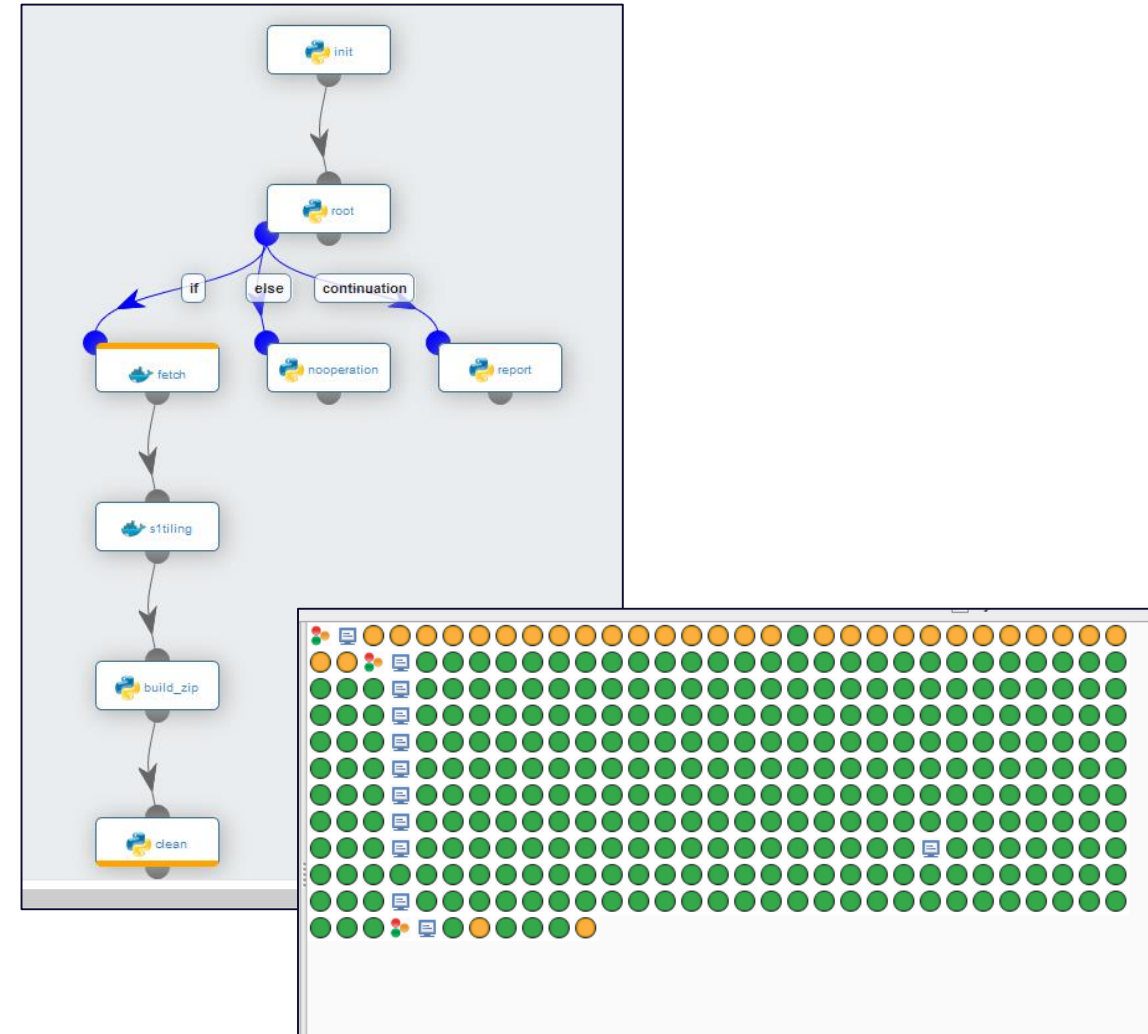
2. Trigger image processing workflow with relevant parameters through WPS



3. Provide data to end user

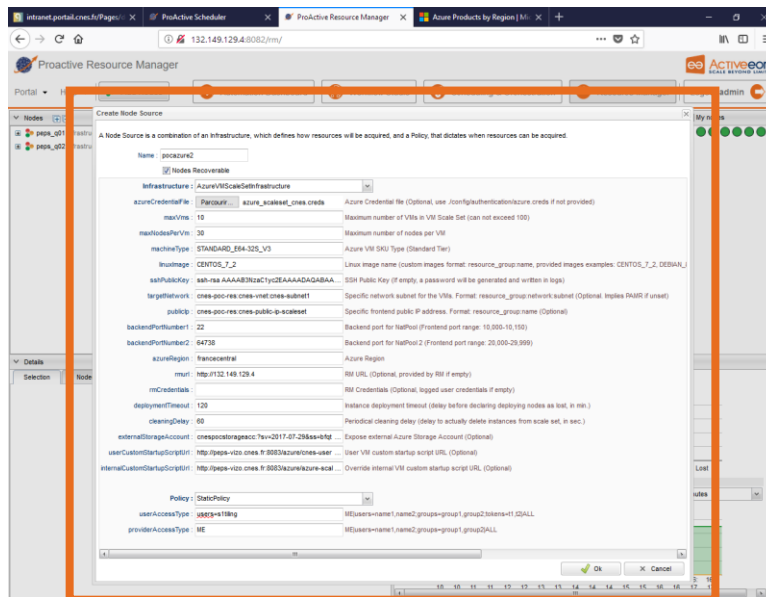


4. Close unnecessary nodes

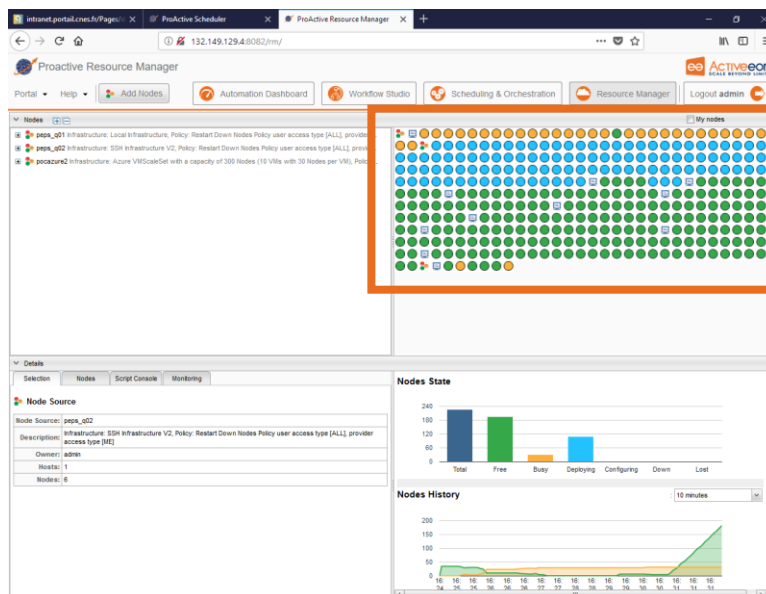


Resource Acquisition

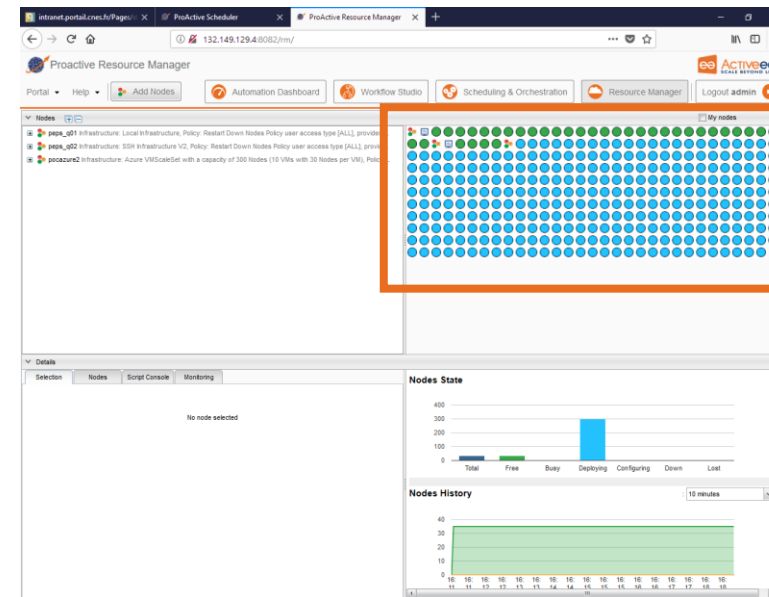
1
Resource acquisition from the RM



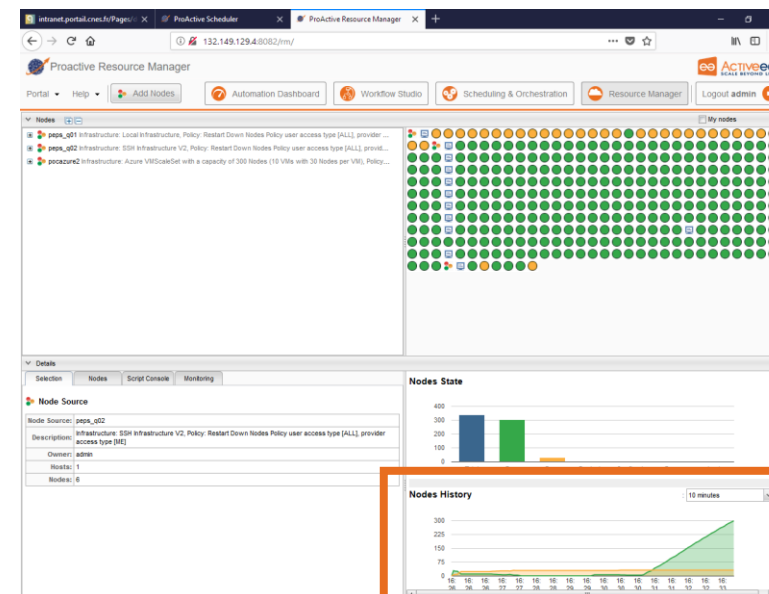
3
First VMs Connected



2
Waiting for VMs to start



4
Visualize CPU cores available through time



Extensive Parallelization

ProActive Scheduling & Orchestration

Portal Admin Help Submit job Automation Dashboard Workflow Studio Scheduling & Orchestration Resource Manager Logout admin

Executions list My jobs Pending Running Finished Jobs-centric

Id	State	Issues	User	Progress	Priority	Duration	Name	Project	start at
2945	Stalled		s1tling	1 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2944	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2943	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2942	Stalled		s1tling	1 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2941	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2940	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2939	Stalled		s1tling	1 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2938	Stalled		s1tling	1 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2937	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2936	Stalled		s1tling	1 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2935	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2934	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2933	Stalled		s1tling	1 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2932	Stalled		s1tling	1 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	
2931	Stalled		s1tling	3 / 8	Normal		ORTHO_S1_GRD_CLOUD	PEPS	

<< First < Previous Total number of jobs: 251 Next > Last >>

Details

Tasks Visualization Users Sessions Statistics Usage

Job Info Task Info Output Server Logs Preview

Streaming Output Selected tasks Out & Err (1024 lines) Finished Tasks Output

Please select a task from the Tasks tab on the left panel

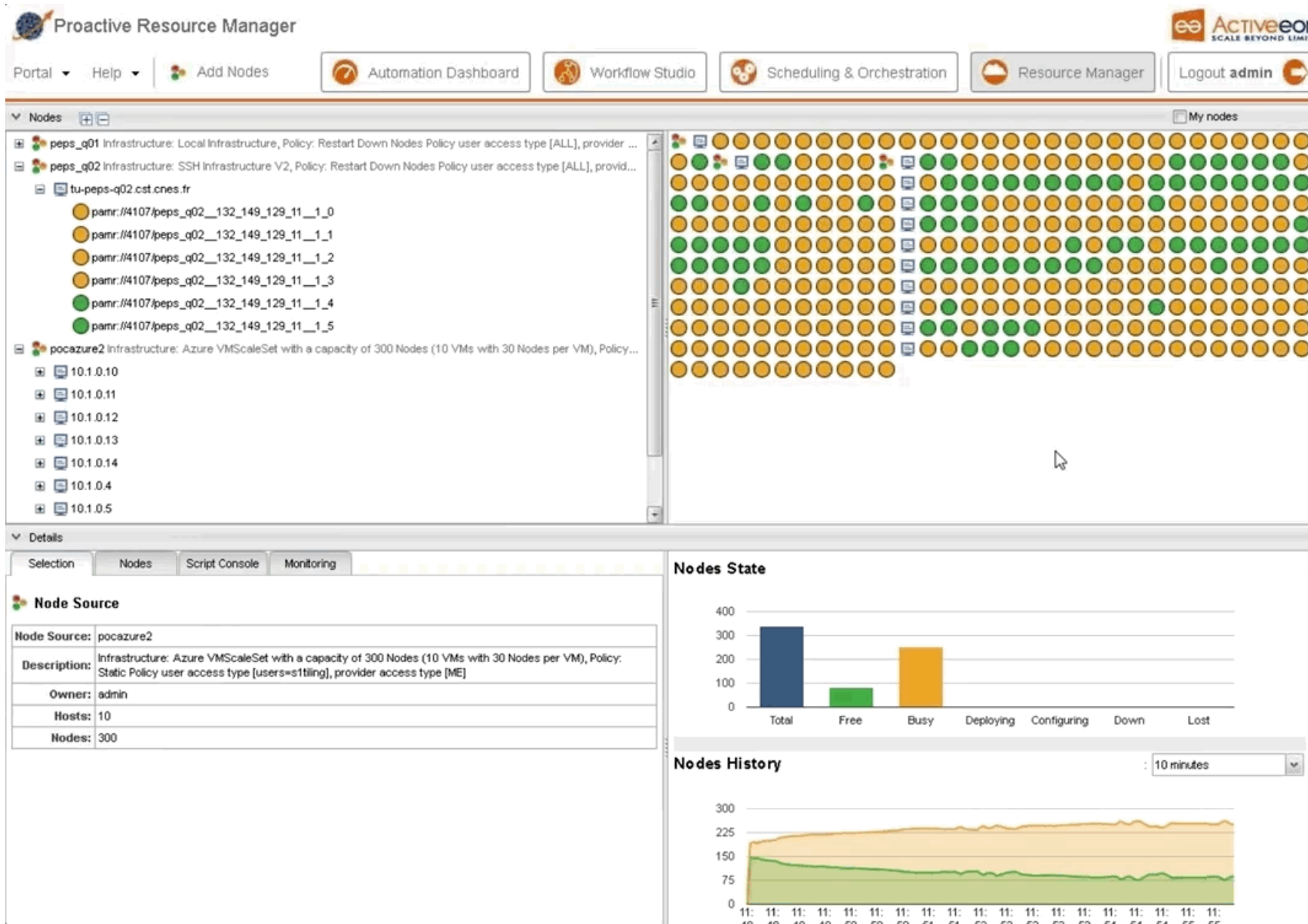
Id	Status	Name	Tag	Duration
0	Finished	init		2s 412ms
1	Finished	root		834ms
2	Pending	fetch		
3	Pending	s1tling		
4	Pending	build_zip		
5	Pending	clean		
6	Skipped	nooperation		0ms
7	Pending	report		

<< First < Previous Page 1 of 1 Tasks 1 - 8 Next > Last >>

Distribution over resource pool

- Clear progress visualization
- Parallelization of tasks
- Log retrieval
- Error management

Resource Manager



The screenshot displays the Proactive Resource Manager interface. At the top, there are navigation buttons for Portal, Help, Add Nodes, Automation Dashboard, Workflow Studio, Scheduling & Orchestration, Resource Manager, and Logout admin. The main area is divided into a left sidebar with a tree view of nodes and a central grid of nodes. The grid shows a large number of nodes, with some colored green (Free) and others yellow (Busy). Below the grid, there are two charts: 'Nodes State' and 'Nodes History'. The 'Nodes State' chart is a bar chart showing the distribution of nodes across different states: Total, Free, Busy, Deploying, Configuring, Down, and Lost. The 'Nodes History' chart is a line graph showing the number of nodes in different states over time, with a 10-minute interval.

Node Source	Description	Owner	Hosts	Nodes
pocazure2	Infrastructure: Azure VMScaleSet with a capacity of 300 Nodes (10 VMs with 30 Nodes per VM), Policy: Static Policy user access type [users=s1tling], provider access type [ME]	admin	10	300

Nodes State

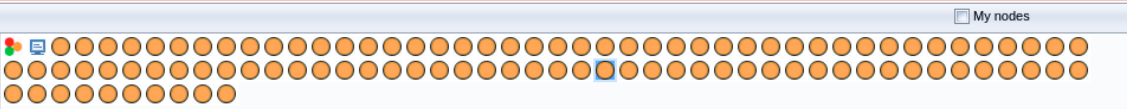
State	Count
Total	300
Free	~100
Busy	~200
Deploying	0
Configuring	0
Down	0
Lost	0

Nodes History

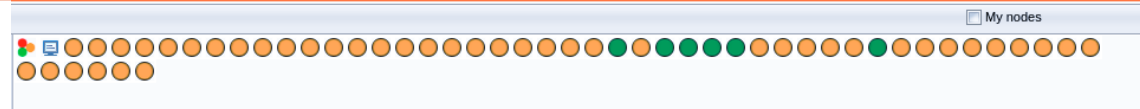
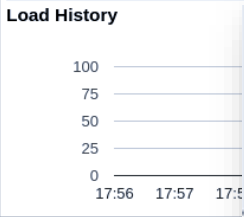
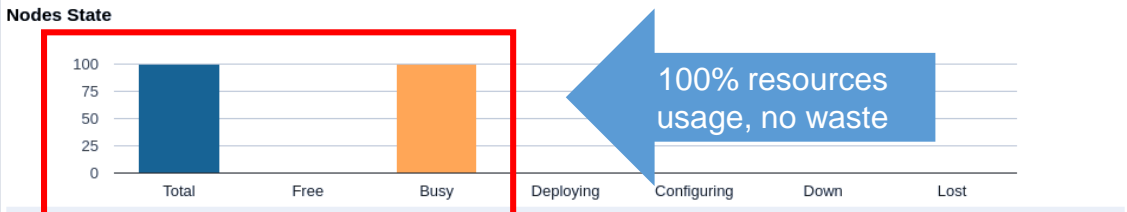
Time	Total	Free	Busy
11:11:00	~250	~100	~150
11:11:05	~250	~100	~150
11:11:10	~250	~100	~150
11:11:15	~250	~100	~150
11:11:20	~250	~100	~150
11:11:25	~250	~100	~150
11:11:30	~250	~100	~150
11:11:35	~250	~100	~150
11:11:40	~250	~100	~150
11:11:45	~250	~100	~150
11:11:50	~250	~100	~150
11:11:55	~250	~100	~150
11:12:00	~250	~100	~150

- > 20,000 cores
- VM monitoring
- Resource utilization status

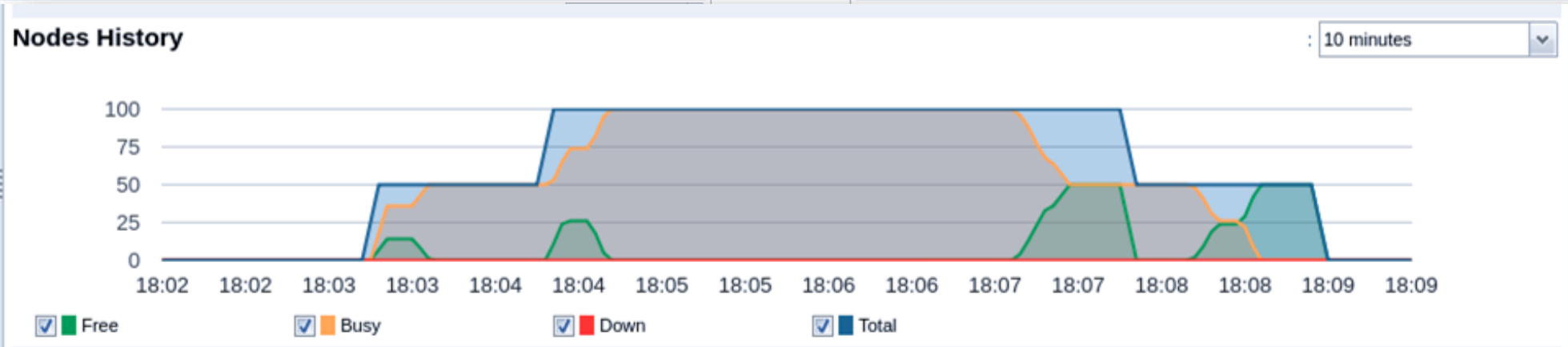
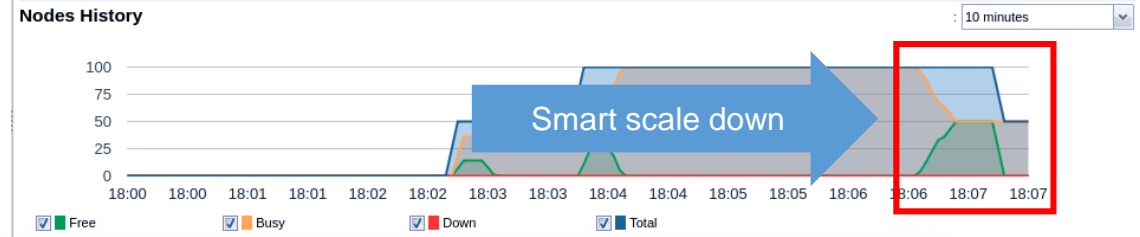
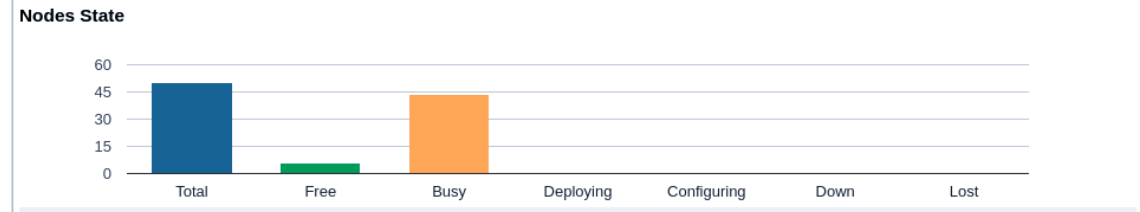
Elasticity: Automatic On-Demand VMs



Provides cloud computing power according to your needs. Minimize costs by deploying VMs only when needed (configurable load factor). Never exceed your budget (min/max VMs threshold).

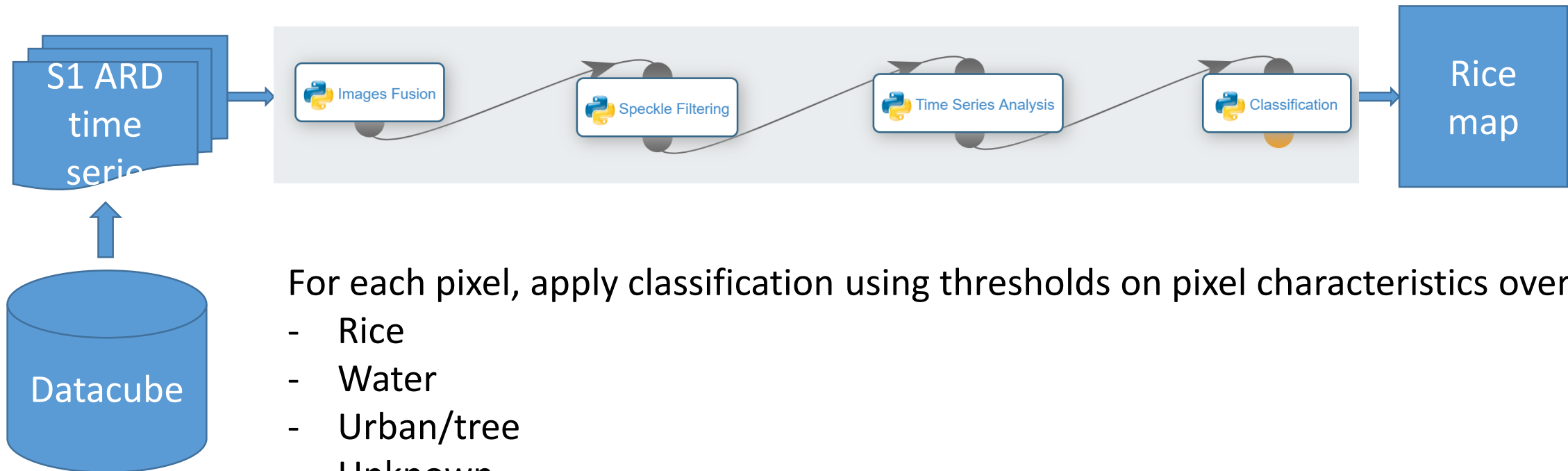


Smart and fully configurable elastic policy. Shutdown unused VMs whenever it's possible. Prevent time-consuming re-deployments by adjusting idle nodes' release delay (avoid scale up/down cycles).

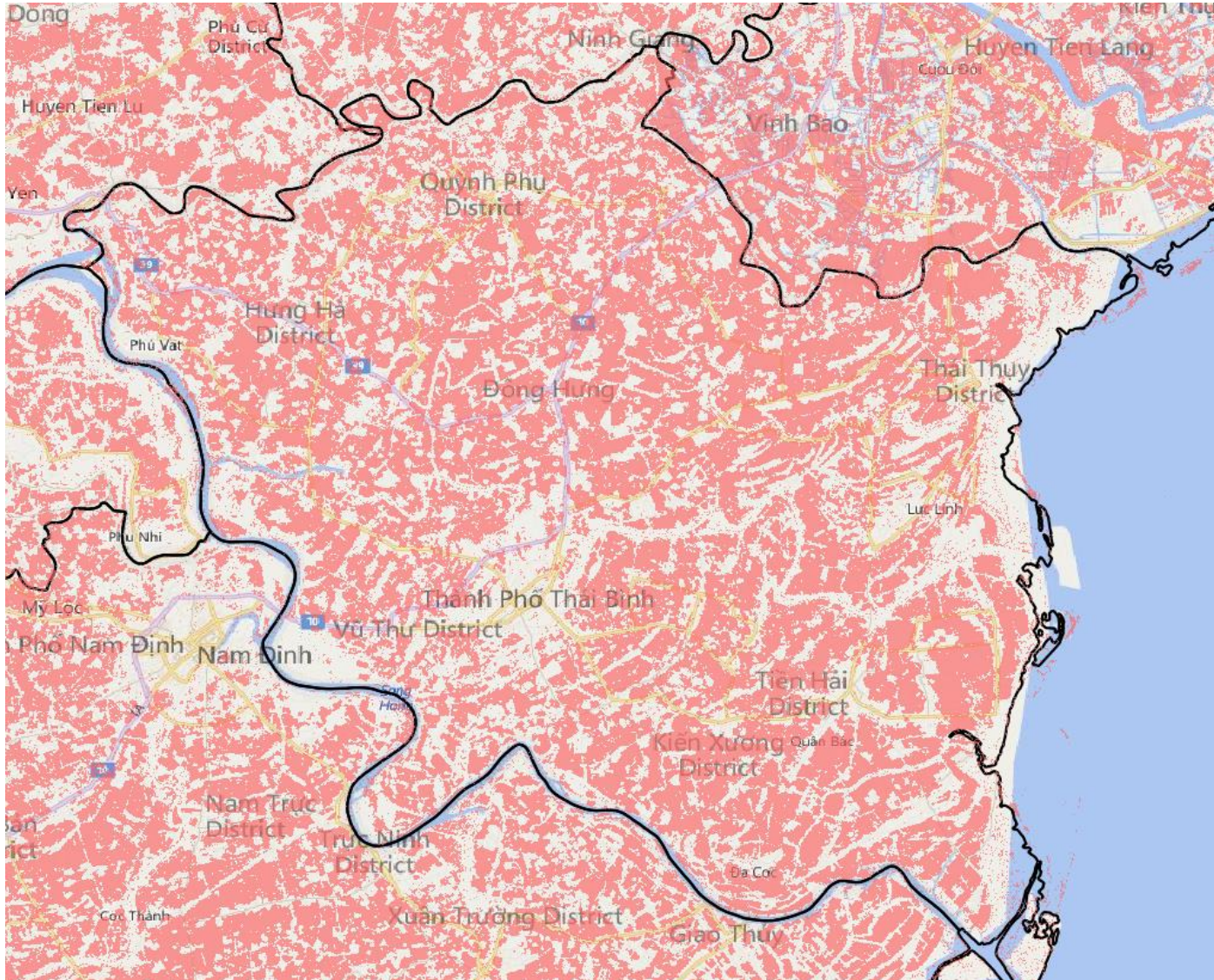


Demonstration of Rice mapping

- Objectives: Generate a rice map using Sentinel-1 time series
- Algorithm description:



Example of Result: Rice Growth and Harvest Prediction



**Winter-Spring Rice Map,
Thai Binh province,
Thailand**

our journey

by  cnes

Benefits of ActiveEon

ProActive Integration

- Leverage Docker Images
 - Agile development
- Activeeon / CNES



Installation on CNES infrastructure

- Automated scripts
- Simplified upgrade



Azure Connection

- Azure expert support
- Security compliance

ActiveEon + Azure:

- Resource agnostic
- Hybrid platform

Benefits of ActiveEon

WPS connector

- Open platform
- Rest API

Connector Integration

- Azure Scale-Set for Advanced resource strategy
- Storage upgrade planned with Scality

To be continued...



Activeeon
SCALE BEYOND LIMITS

Conclusion

Objective for Sentinel Satellites:

Make Sentinel data available to the greatest number and encourage the development of applications using them (agriculture, maritime field...). 1 petabyte (10¹⁵ bytes) in 20 years and now 7 petabytes in 2 years!

Solution

ActiveEon OW2 to execute on Azure in hybrid mode allows enhancing PEPS data and making them available to API providers :

- Multi-Cloud Ecosystem Platform
- Remove complexity for Data Scientists
- Provide Cloud performance

Benefits

- Optimisation of On-Prem ressources & Clouds
- Faster execution
- Easier to use by end-users
- Cost Reduction with ActiveEon Elastic Provisioning





Activeeon
SCALE BEYOND LIMITS

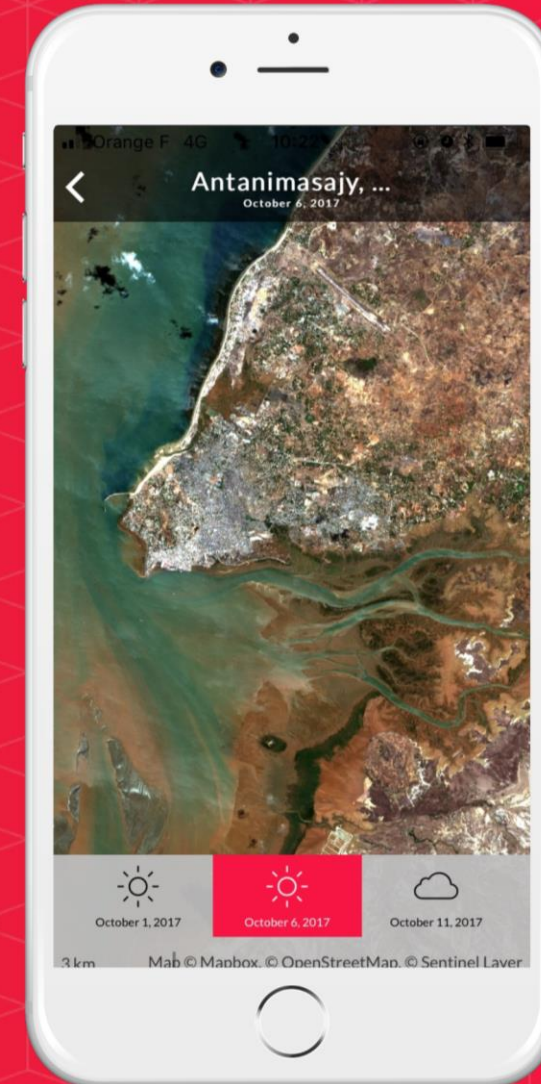
SnapPlanet

DOWNLOAD FEATURES CONTACT



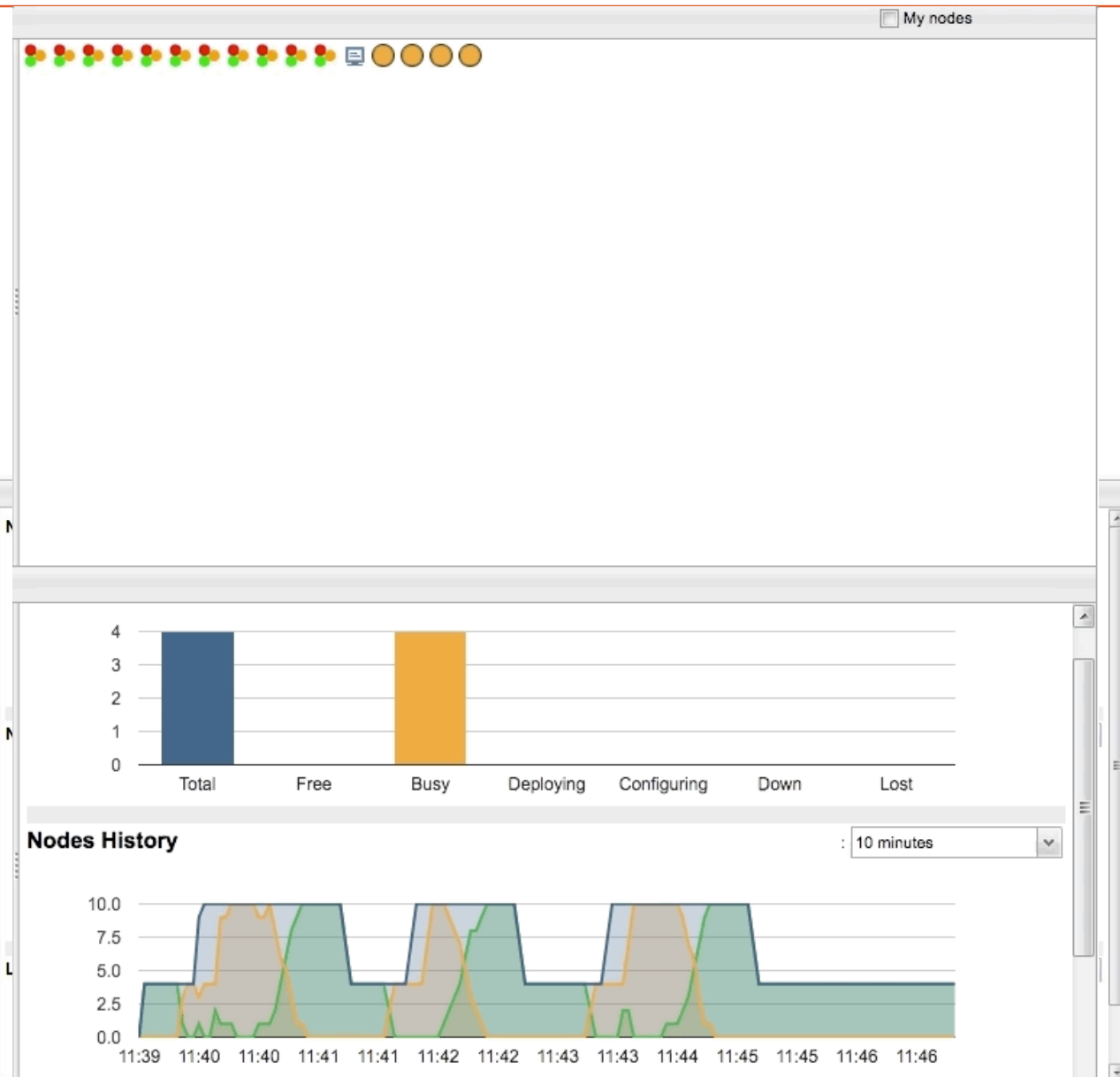
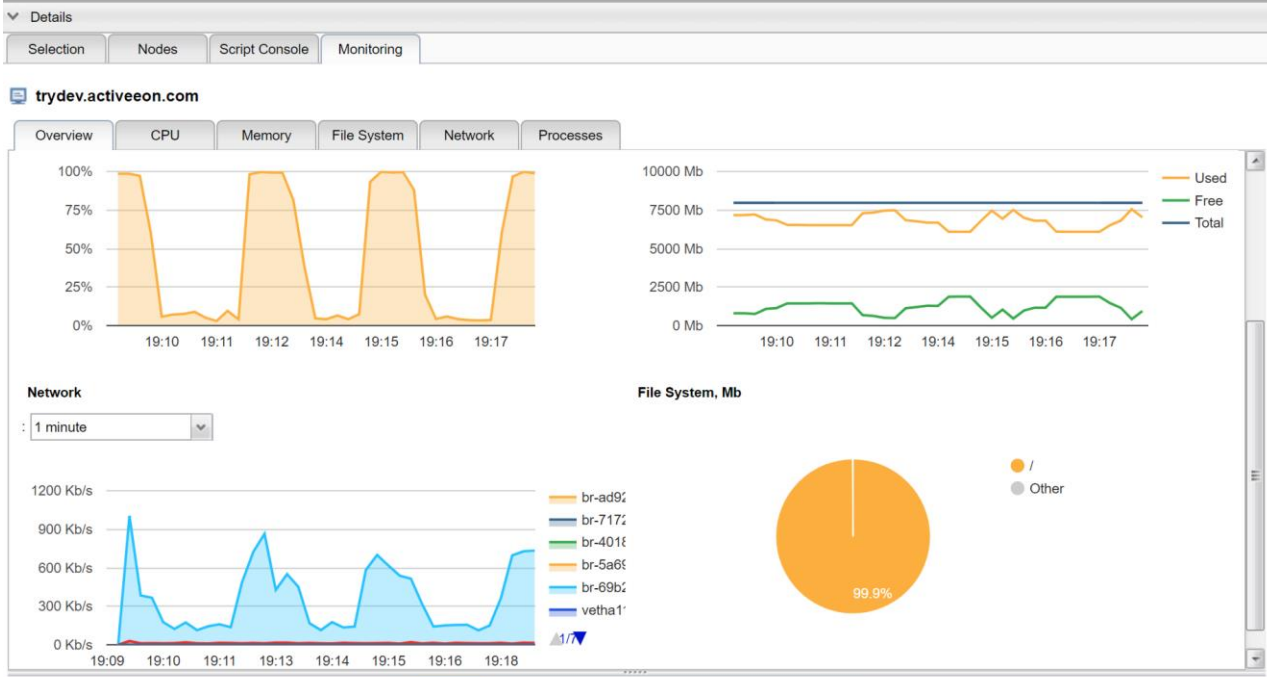
An app for everyone to
create and share
pictures of the Earth
from space

START NOW !





Elasticity: Automatic On-Demand VMs


- Node Source Elasticity: Acquire & Release Resources based on Load.
- Pay only for the Cloud you need

















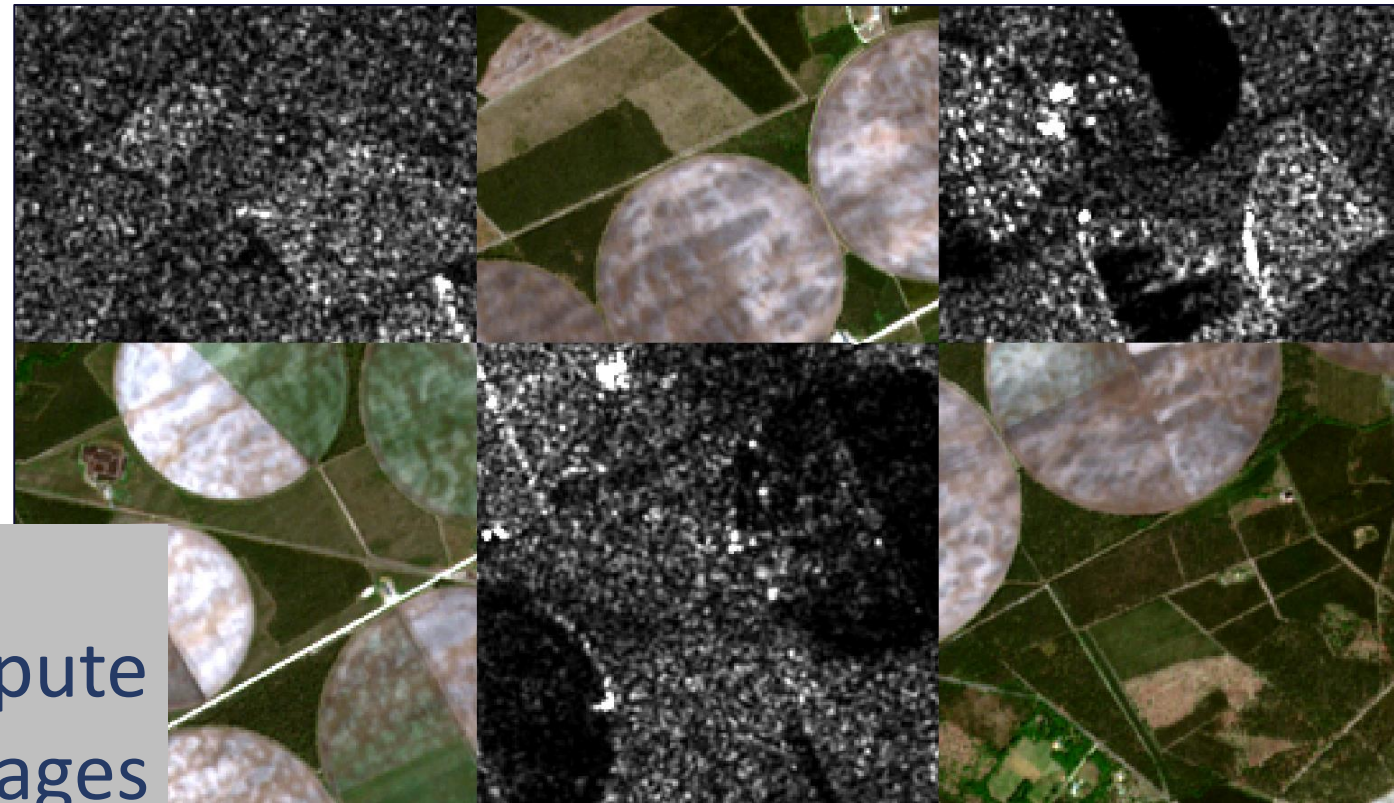
Result and Integration

ccnes **peps** ACCUEIL EXPLORER MOSAÏQUE MONDIALE PEPS-RSS PLUS  

MA SÉLECTION MES TRAITEMENTS MES RÉSULTATS

Liste des traitements 

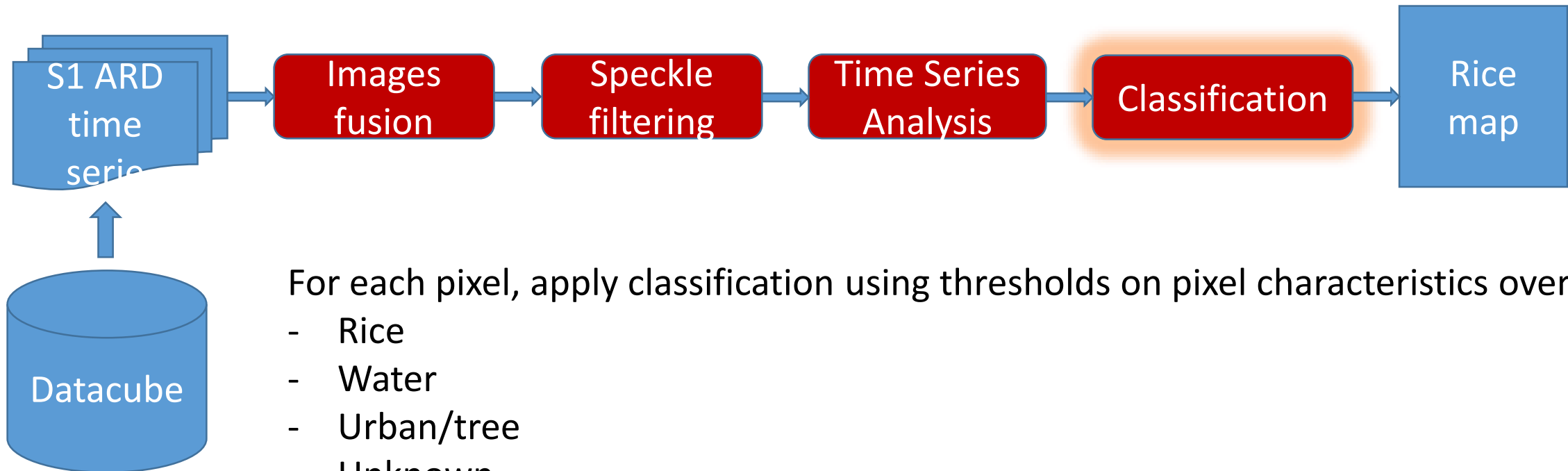
Identifiant	Nom	Date	Status		Actions
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36	ORTHO_S1_GRD	2017-10-10 12:58:18	x	<div style="width: 100%;"><div style="width: 100%;"></div></div>	 
32	ORTHO_S1_GRD	2017-09-29 11:03:15	✓	<div style="width: 100%;"><div style="width: 100%;"></div></div>	 
31	ORTHO_S1_GRD	2017-09-29 11:02:45	✓	<div style="width: 100%;"><div style="width: 100%;"></div></div>	 



From PEPs Portal access compute power and processed images

Demonstration of Rice mapping

- Objectives: Generate a rice map using Sentinel-1 time series
- Algorithm description:



For each pixel, apply classification using thresholds on pixel characteristics over time:

- Rice
- Water
- Urban/tree
- Unknown

Space & Image Processing



Situation

Make Sentinel data available to the greatest number and encourage the development of applications using them (agriculture, maritime field...)

Solution

Proactive Solution provided by ActiveEon to execute on Azure in hybrid mode allows enhancing PEPS data and making them available to API providers :

- Multi-Cloud Ecosystem Platform
- Remove complexity for Data Scientists
- Provide Cloud performance

Benefits

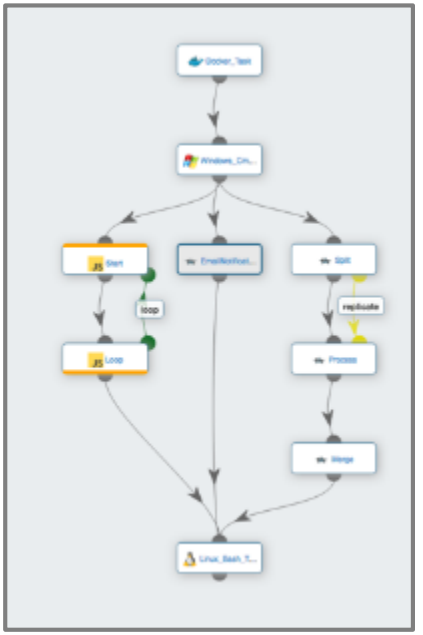
- Faster execution, Optimisation of On-Prem ressources & Clouds,
- Easier to use by end-users
- Same Workflows On-Prem & On Cloud



On-Prem & Hybrid- Multi-cloud Orchestration



Scale automatically - Leverage All Resources



- hadoop
- kubernetes
- docker
- java
- spark
- python
- sas
- GREENPLUM DATABASE
- ANACONDA
- kafka

