RADON

RADON Webinar III

RADON Data Pipelines

Agenda

- Introduction
  - Data Pipelines
  - RADON framework
  - OASIS TOSCA
- RADON data pipeline models
- Tutorial demo

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Rational Decomposition and Orchestration for Serverless Computing

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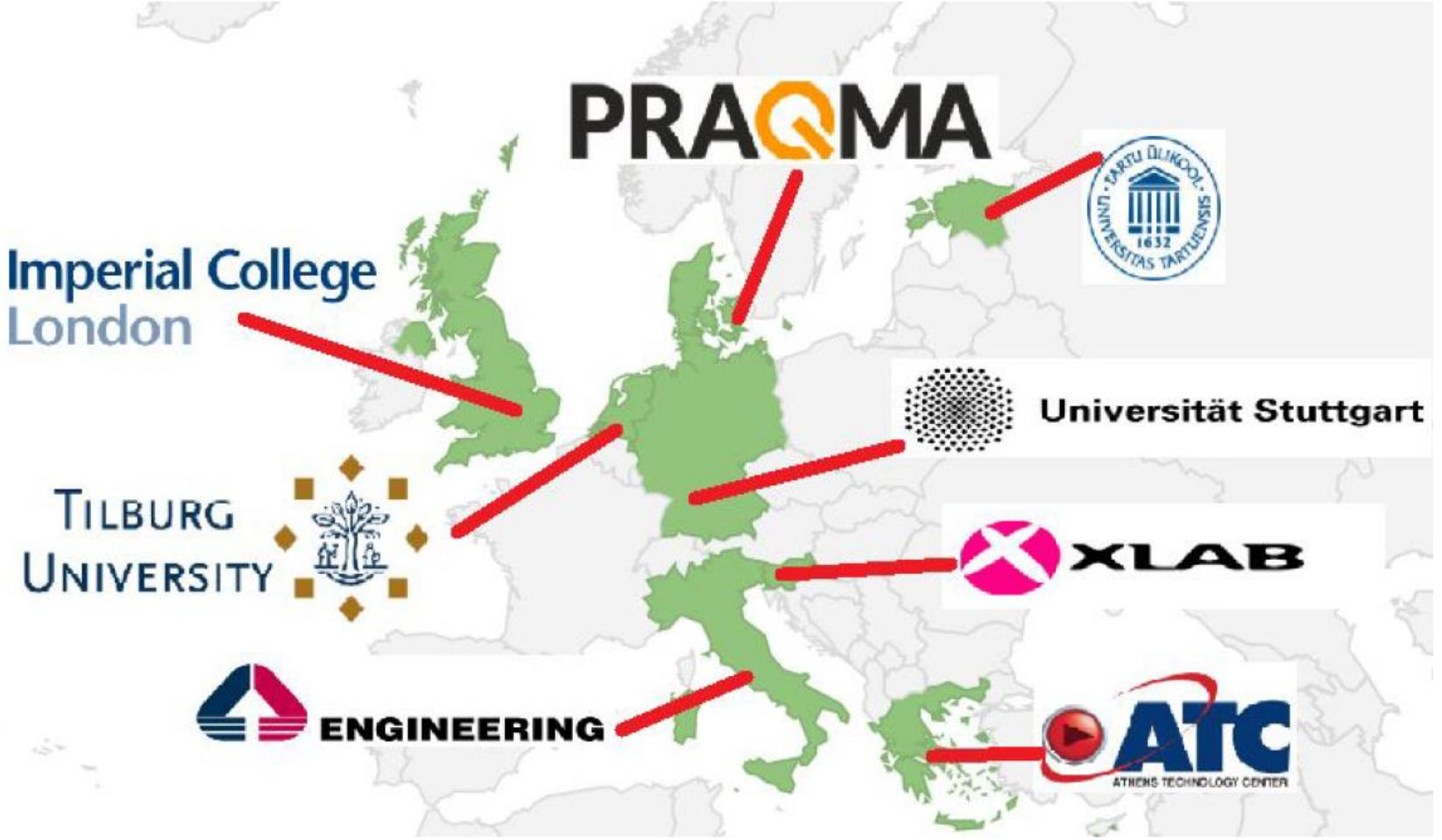
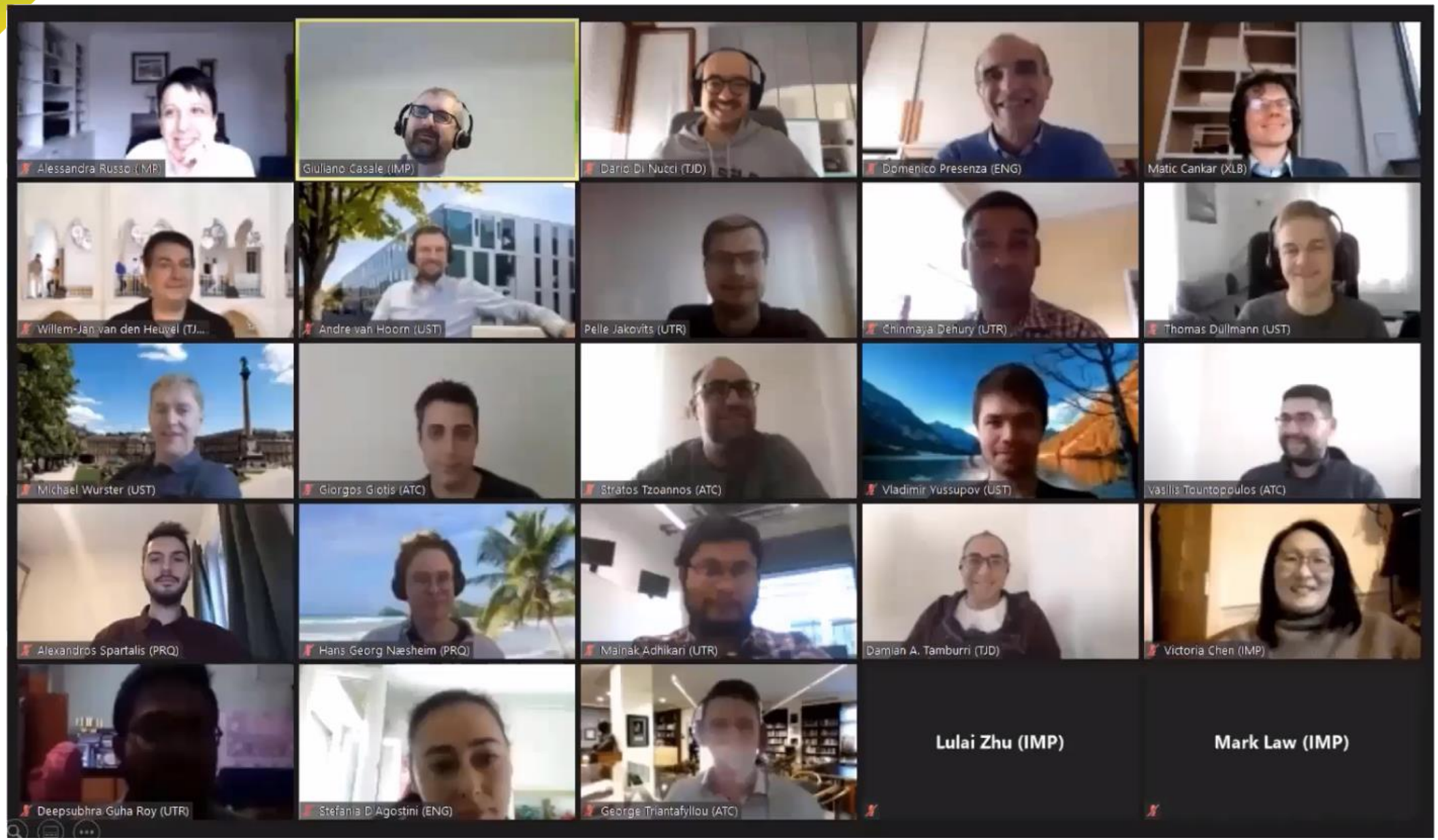
Value proposition:

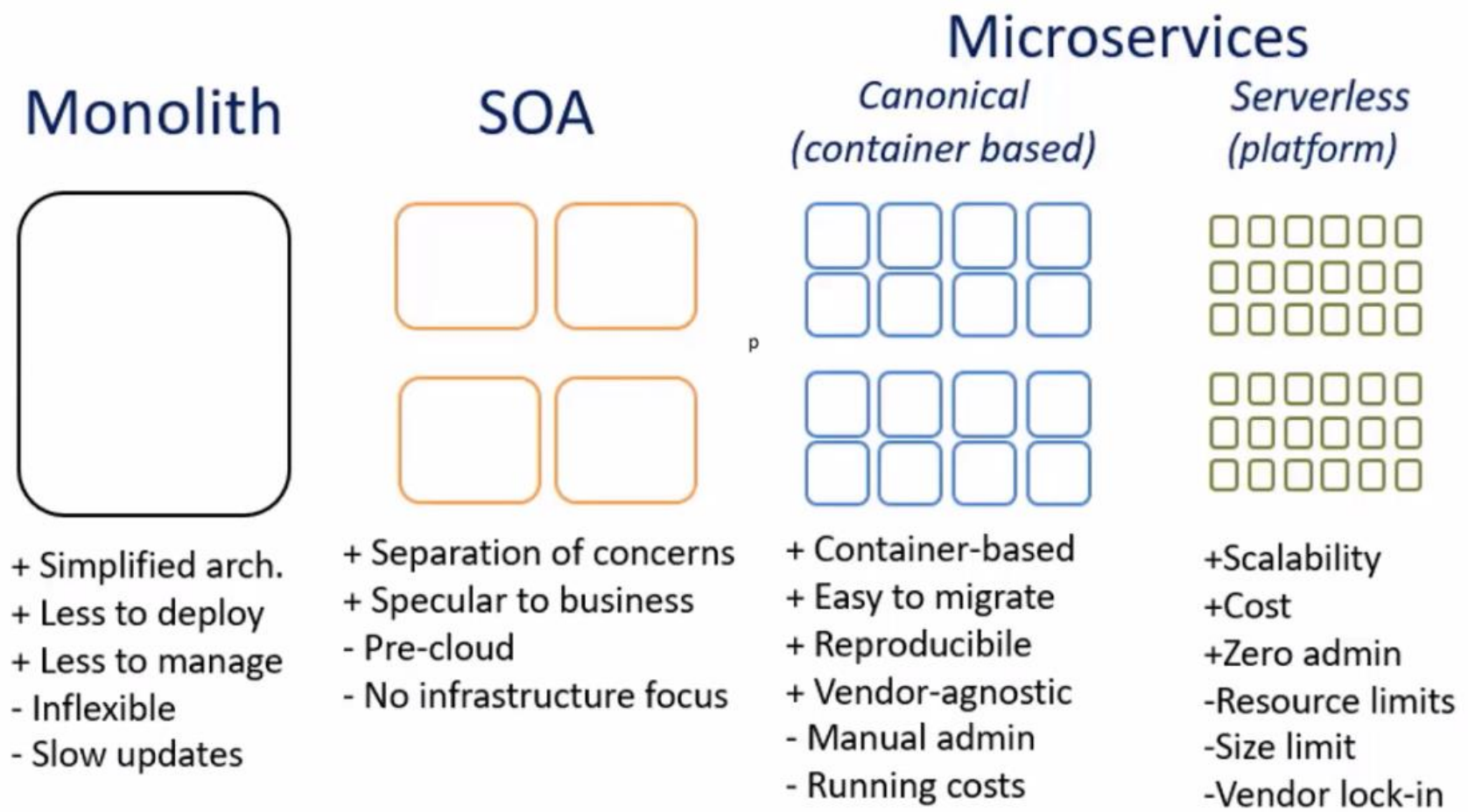
Offer a **DevOps framework** to help the EU software industry adopting **serverless FaaS** without vendor lock-in



RADON consortium



From Monoliths to Serverless



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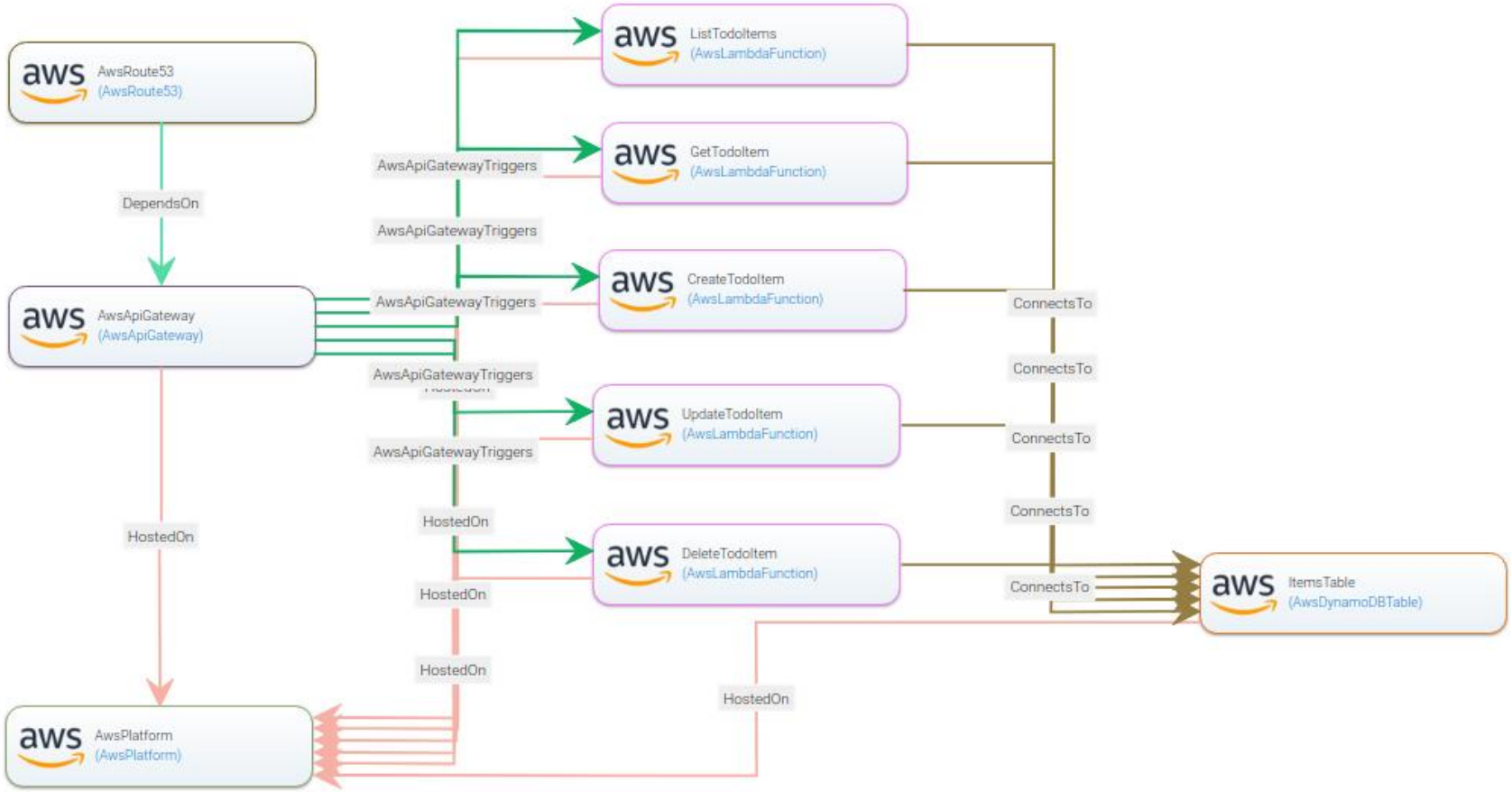
Intro: TOSCA

TOSCA

- Topology and Orchestration Specification for Cloud Applications (TOSCA)
- Standard for automating the deployment and management of cloud applications
- Started by major companies, such as IBM.
- Major goals:
  - Automation of Deployment and Management
  - Portability
  - Interoperability
  - Vendor-neutral ecosystem

TOSCA Example

```
1  tosca_definitions_version: tosca_simple_yaml_1_3
2
3  metadata:
4    targetNamespace: "radon.blueprints"
5  topology_template:
6    node_templates:
7      AwsLambdaFunction_1:
8        type: radon.nodes.aws.AwsLambdaFunction
9        metadata:
10         x: "894"
11         y: "207"
12         displayName: "GetTodoItem"
13       properties:
14         handler: "get.handler"
15         memory: 128
16         name: "get-item"
17         runtime: "nodejs12.x"
18         alias: "dev"
19         statement_id: "get-stmt"
20         zip_file: { get_artifact: [ SELF, get_item ] }
21         timeout: 300
22         env_vars:
23           TODOS_TABLE: "items"
24       requirements:
25         - endpoint:
```



For more info on TOSCA, check previous webinars in the **RADON H2020** Youtube channel

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Intro: Data Pipelines

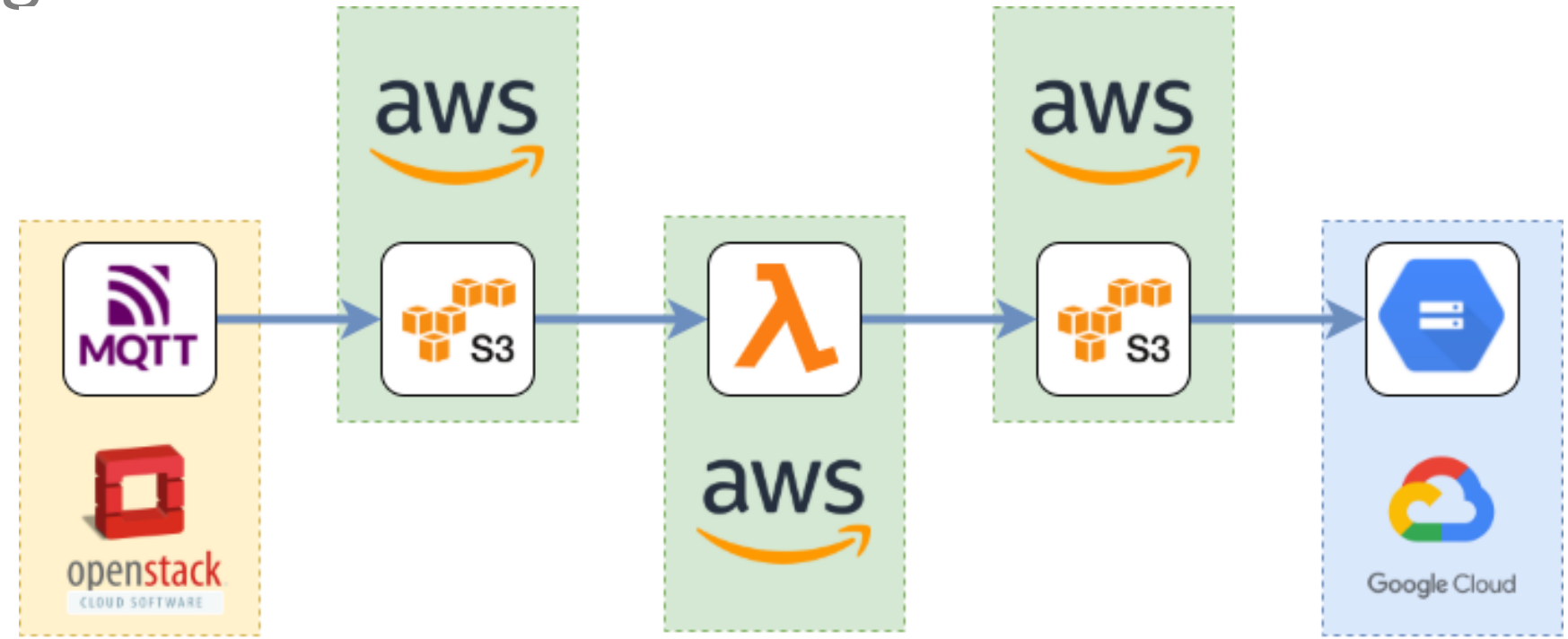
Data Pipelines

- Services for automating the data migration, processing and storage across multi-cloud enviornements
- Support distributed FaaS applications
  - Where functions are deployed on-premise, HPC or on different cloud providers

- **Goal:** Re-useable data pipeline services that can be composed into more complex data management pipelines

Example data pipeline

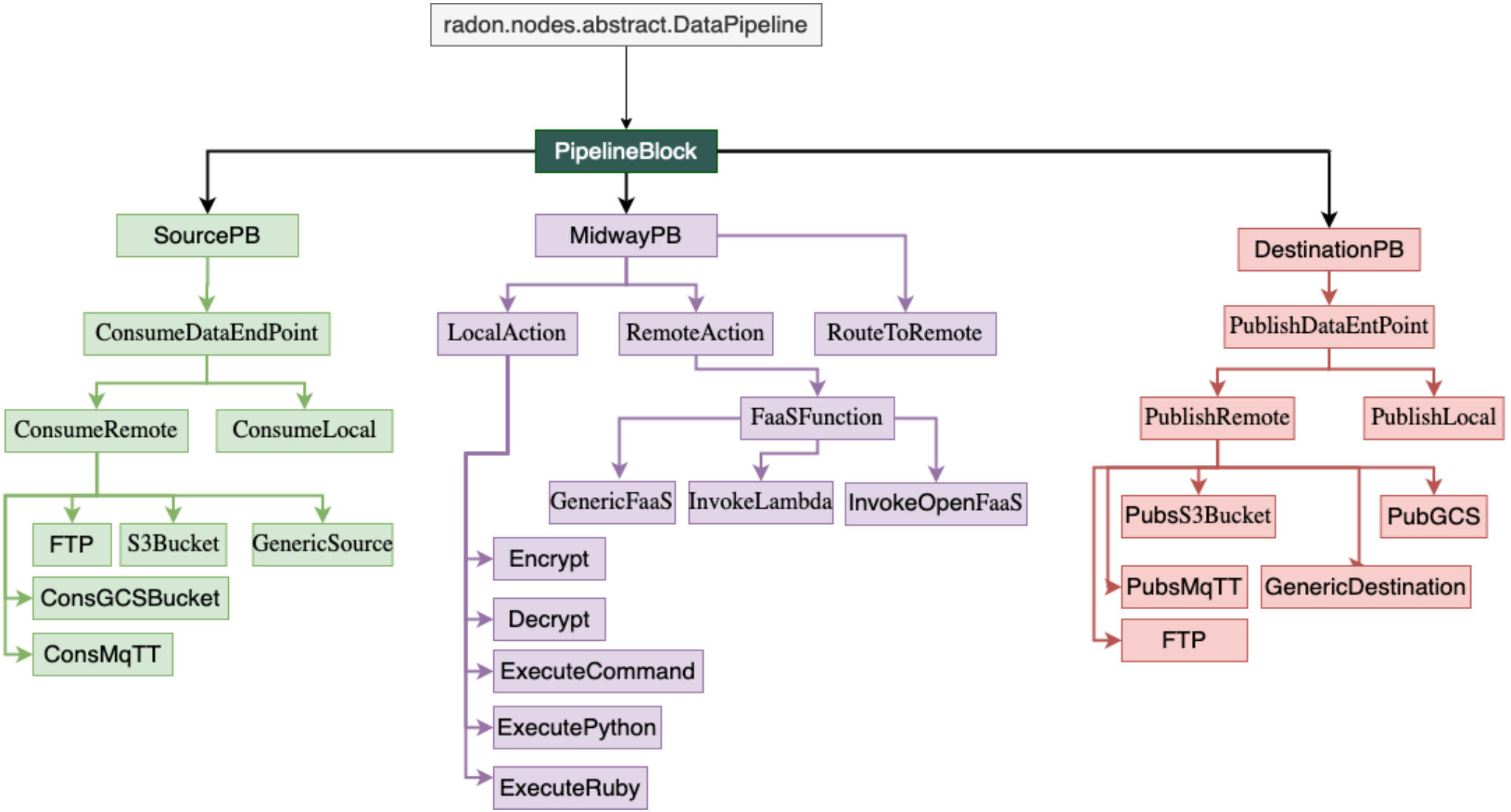
Real-time data migration from Openstack to AWS to Google Cloud



RADON data pipelines

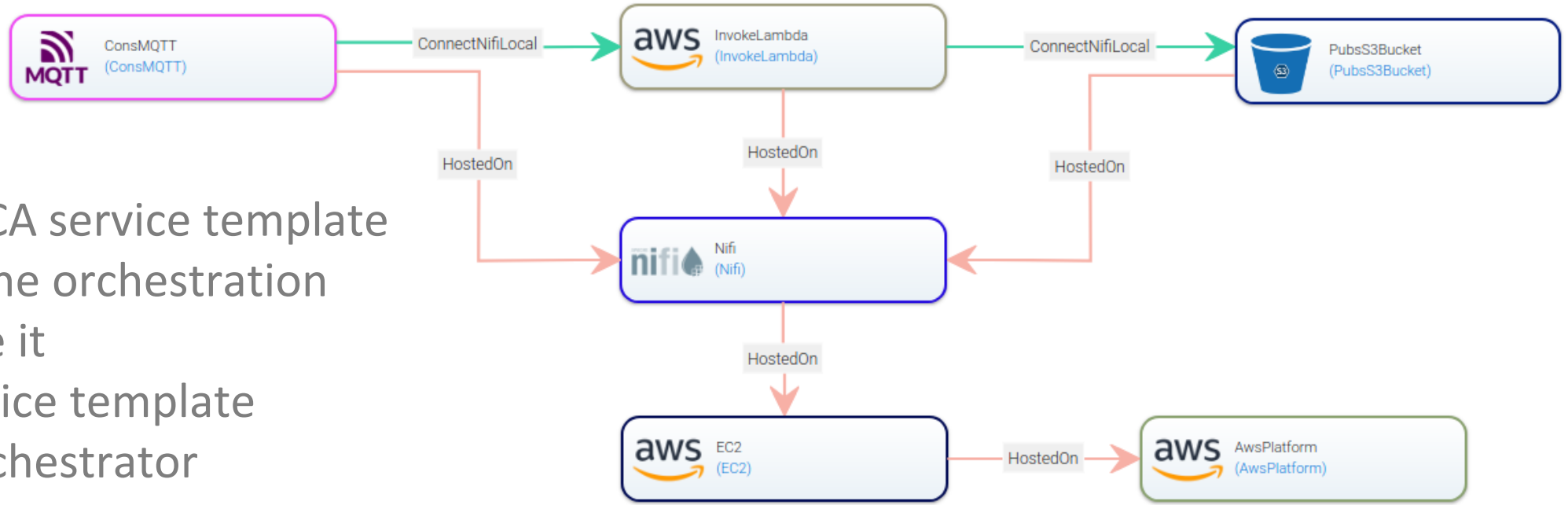
- Extend TOSCA with support for modelling data migration and management across multi-cloud environments
- Provide a set of reusable node types which can be composed into data pipelines
- Data automation is implemented by:
  - Apache NiFi
  - AWS Data pipeline service
- Ansible is used to install, configure and start the underlying services and cloud resources

RADON data pipeline models



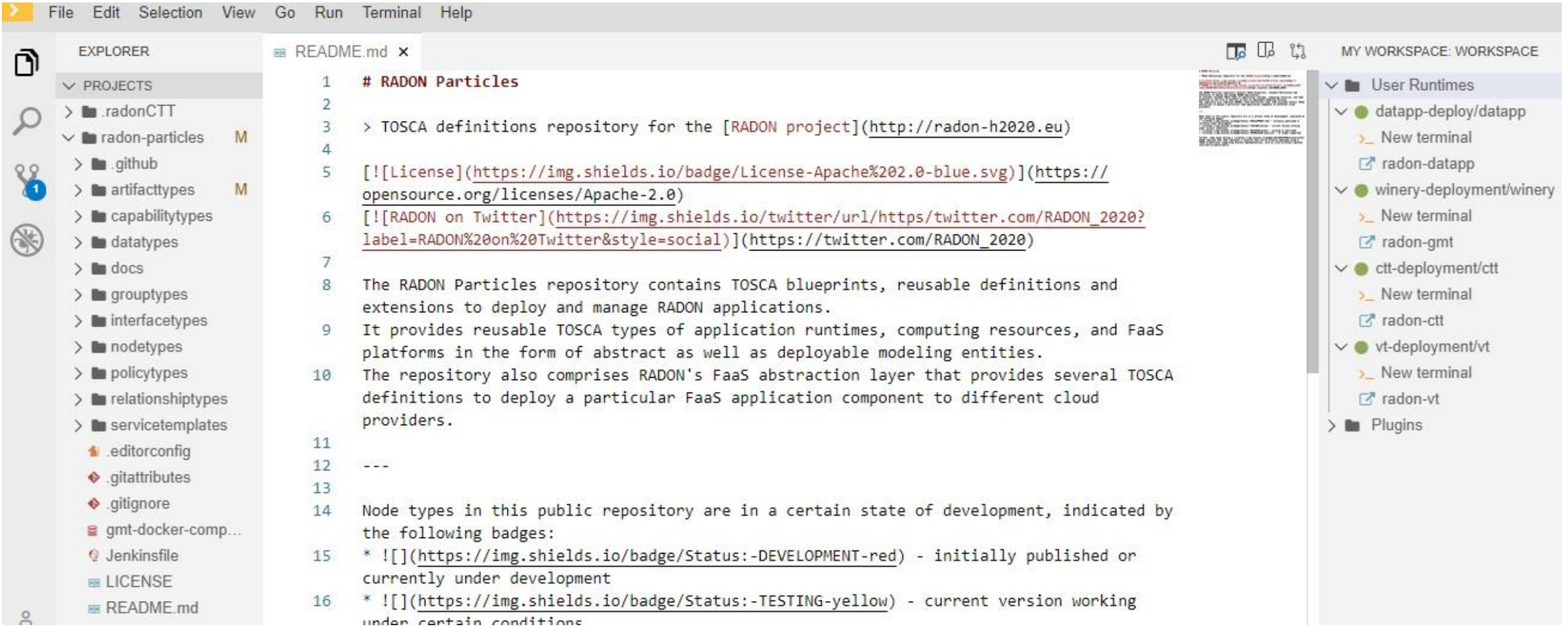
Using RADON tools

- Access RADON web IDE
- Use **RADON GMT** to design the Data pipeline
- Define where it is deployed: in AWS EC2 VM, OpenStack VM or as a Docker container



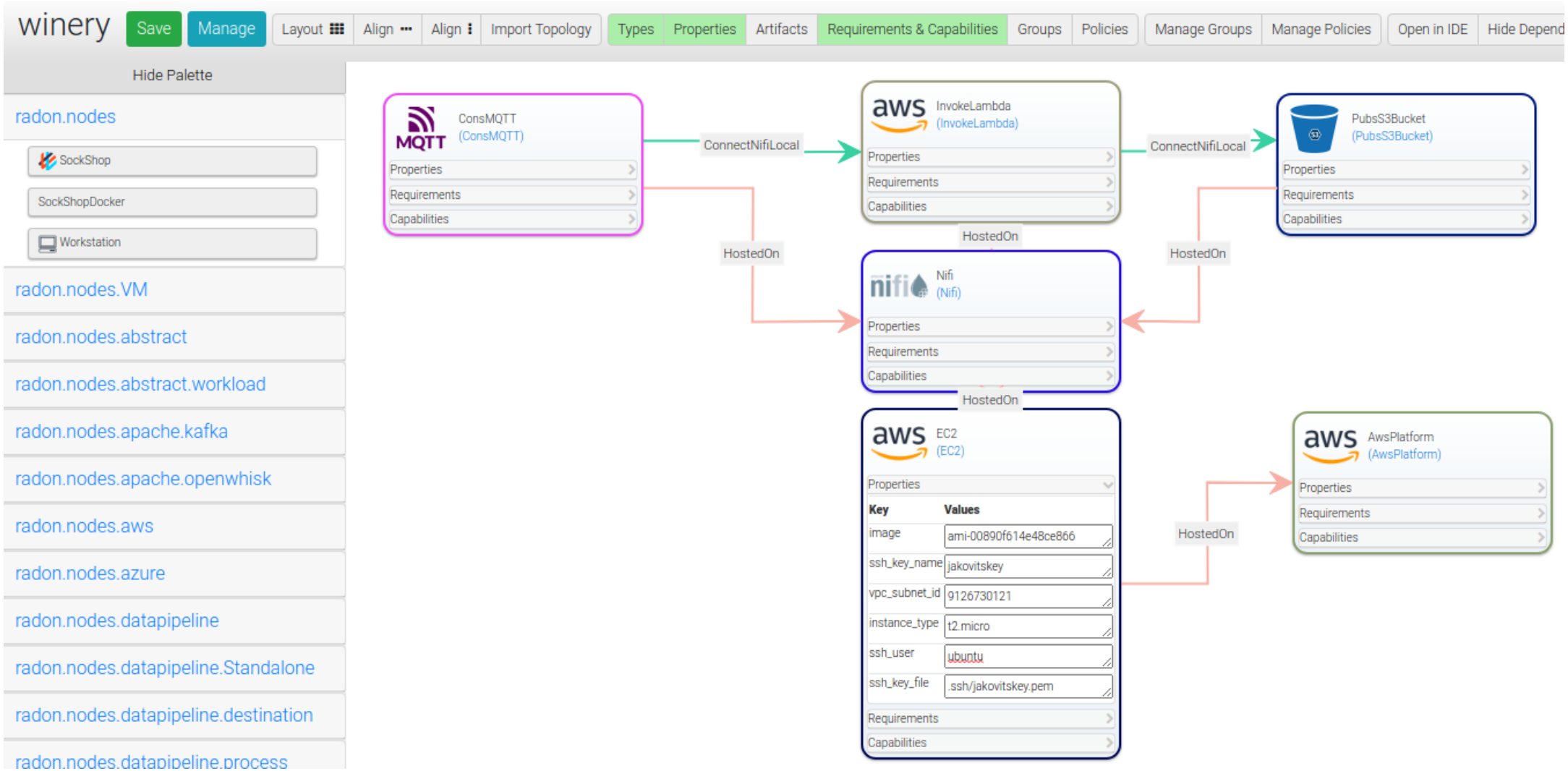
- Download TOSCA service template
- Use Data pipeline orchestration plugin to validate it
- Deploy the service template using RADON Orchestrator

RADON IDE


File Edit Selection View Go Run Terminal Help
EXPLORER
README.md
MY WORKSPACE: WORKSPACE
PROJECTS
.radonCTT
radon-particles M
.github
artifacttypes M
capabilitytypes
datatypes
docs
grouptypes
interfacetypes
nodetypes
policytypes
relationshiptypes
servicetemplates
.editorconfig
.gitattributes
.gitignore
gmt-docker-comp...
Jenkinsfile
LICENSE
README.md
RADON Particles
> TOSCA definitions repository for the [RADON project](http://radon-h2020.eu)
[![License](https://img.shields.io/badge/License-Apache%202.0-blue.svg)](https://opensource.org/licenses/Apache-2.0)
[![RADON on Twitter](https://img.shields.io/twitter/url/https/twitter.com/RADON_2020?label=RADON%20on%20Twitter&style=social)](https://twitter.com/RADON_2020)
The RADON Particles repository contains TOSCA blueprints, reusable definitions and extensions to deploy and manage RADON applications.
It provides reusable TOSCA types of application runtimes, computing resources, and FaaS platforms in the form of abstract as well as deployable modeling entities.
The repository also comprises RADON's FaaS abstraction layer that provides several TOSCA definitions to deploy a particular FaaS application component to different cloud providers.

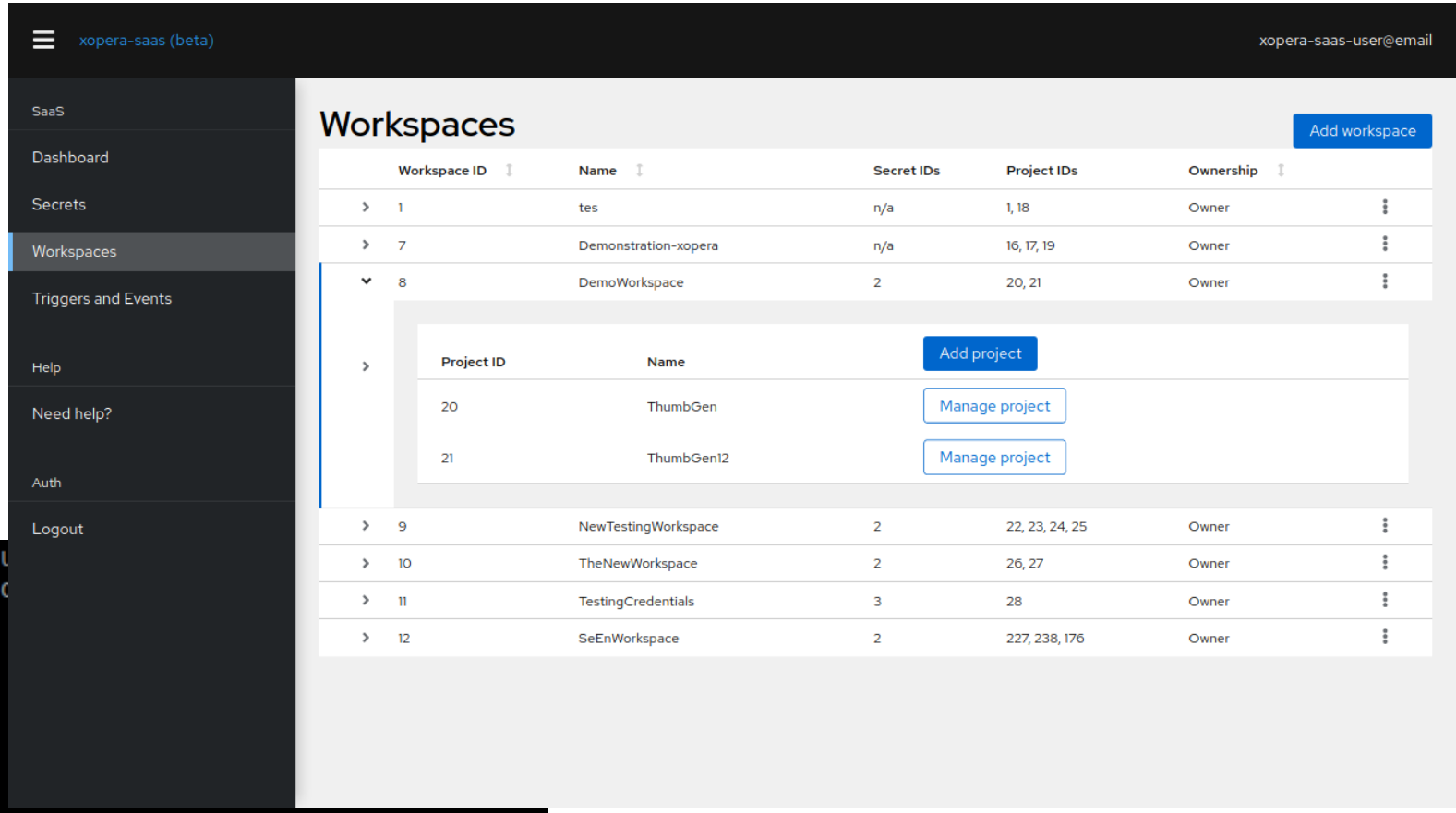
Node types in this public repository are in a certain state of development, indicated by the following badges:
* - initially published or currently under development
* - current version working
User Runtimes
datapp-deploy/datapp
New terminal
radon-datapp
winery-deployment/winery
New terminal
radon-gmt
ctt-deployment/ctt
New terminal
radon-ctt
vt-deployment/vt
New terminal
radon-vt
Plugins

RADON GMT: Winery



RADON orchestrator: xOpera

- SaaS version
- CLI version




```
(.venv) ubuntu@pelletest88:~/opera$ opera deploy  -r pelleazu
The resume deploy option might have unexpected consequences c
Do you want to continue? (Y/n): y
[Worker_0]   Deploying AzurePlatform_0_0
[Worker_0]     Executing create on AzurePlatform_0_0
[Worker_0]   Deployment of AzurePlatform_0_0 complete
[Worker_0]   Deploying AzureResourceGroup_0_0
[Worker_0]     Executing create on AzureResourceGroup_0_0
[Worker_0]   Deployment of AzureResourceGroup_0_0 complete
[Worker_0]   Deploying AzureStorageAccount_0_0
[Worker_0]     Executing create on AzureStorageAccount_0_0
[Worker_0]   Deployment of AzureStorageAccount_0_0 complete
[Worker_0]   Deploying AzureHttpTriggeredFunction_0_0
[Worker_0]     Executing create on AzureHttpTriggeredFunction_0_0
[Worker_0]   Deployment of AzureHttpTriggeredFunction_0_0 complete
```

Additional information

- TOSCA open source nodetypes: https://github.com/radon-h2020/radon-particles/
- Data Pipeline documentation: https://datapipeline-plugin.readthedocs.io
- RADON videos: https://www.youtube.com/channel/UCgoXX6JZ6bDqTxVBRm4KWnQ
- RADON github: https://github.com/radon-h2020/
- RADON website: https://radon-h2020.eu/

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Demo