Infrastructure Manager:
TOSCA deployment and orchestration in the Cloud Continuum

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IM Introduction

- IM is a service that **deploys virtual infrastructures** on top of Cloud resources.

- It uses **RADL** or **TOSCA** files to describe the infrastructure.

  - Infrastructure as code (**IaC**)

- The IM **automates** the deployment, configuration, software installation, monitoring and update of virtual infrastructures.

- It supports a wide variety of back-ends, thus making user applications **Cloud agnostic**.

Infrastructure
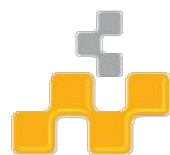Manager

IM Architecture
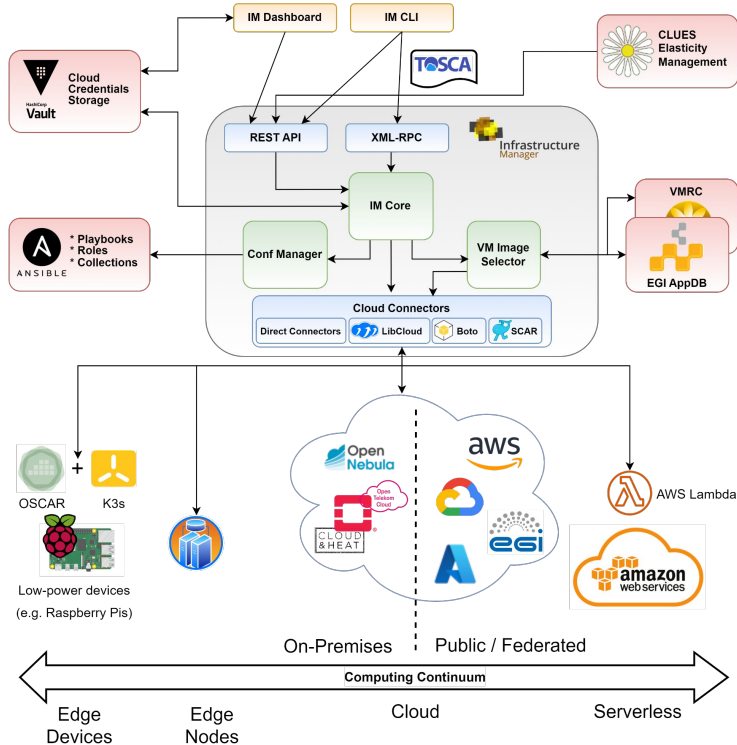
- **CLUES** for automated elasticity.
- **Vault** to securely store credentials.
- **Ansible** for contextualization.
- **AppDB** to get EGI sites information.
- **Cloud continuum** support:
  - Edge devices:
    - OSCAR + K3s on RasPi.
  - Edge nodes:
    - Node with SSH access.
  - On-Premises Cloud:
    - OpenStack, OpenNebula.
  - Public Cloud:
    - AWS, Azure, Google, ...
  - Serverless Public Cloud:
    - AWS Lambda.

GUI: IM Dashboard

- Publicly-available web interface (also open-sourced).
  - https://im.egi.eu
    - Login with **EGI Checkin**.
    - Integrated **with AppDB**.
  - Easily deploy infrastructures from a web browser
    - Set of **curated TOSCA templates**.
    - **Wizard-like composition** of templates.
- Part of the EGI Catalog of Services for Research.

eGi IM Dashboard

Infrastructure Manager Dashboard.

Use a cloud orchestrator to deploy and configure complex virtual infrastructures

Login with EGI Check-in

Infrastructure Manager

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Recent additions

- **Vault** support to store credentials
  - Both at IM level (only to read) and IM-Dashboard to manage the credentials.
  - Accessed on behalf of the user using EGI Checkin token.
  - Also **support of external Vault services**: (e.g. https://secrets.egi.eu)
- **SSH Proxy host** support
  - Configure VMs behind a bastion host
- **Ansible Collections**
  - Enable to install not only **Ansible Roles** but also Collections from Ansible Galaxy.
- Included in the **EGI Service Catalogue**
  - https://www.egi.eu/service/infrastructure-manager/
- **Serverless Support**
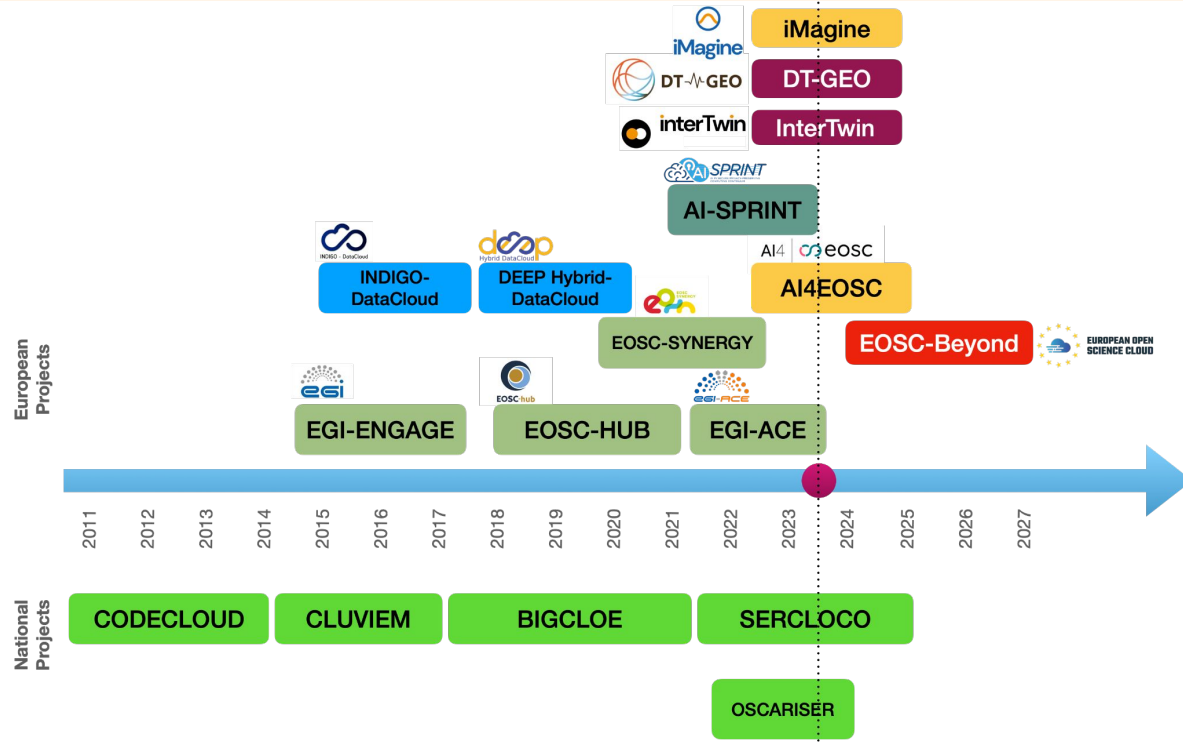 - OSCAR
  - AWS Lambda

Serverless support

- Type of deployments:
  - (1) Edge device:
    - Only deploy OSCAR service on top of an existing cluster.
  - (2) Edge Node:
    - Accessed via SSH.
    - K8s + OSCAR + OSCAR service.
  - (3) Cloud (On-premises/Public)
    - Deploy VM + K8s + OSCAR + OSCAR service.
  - (4) Deploy FaaS function on AWS Lambda
    - Using SCAR.
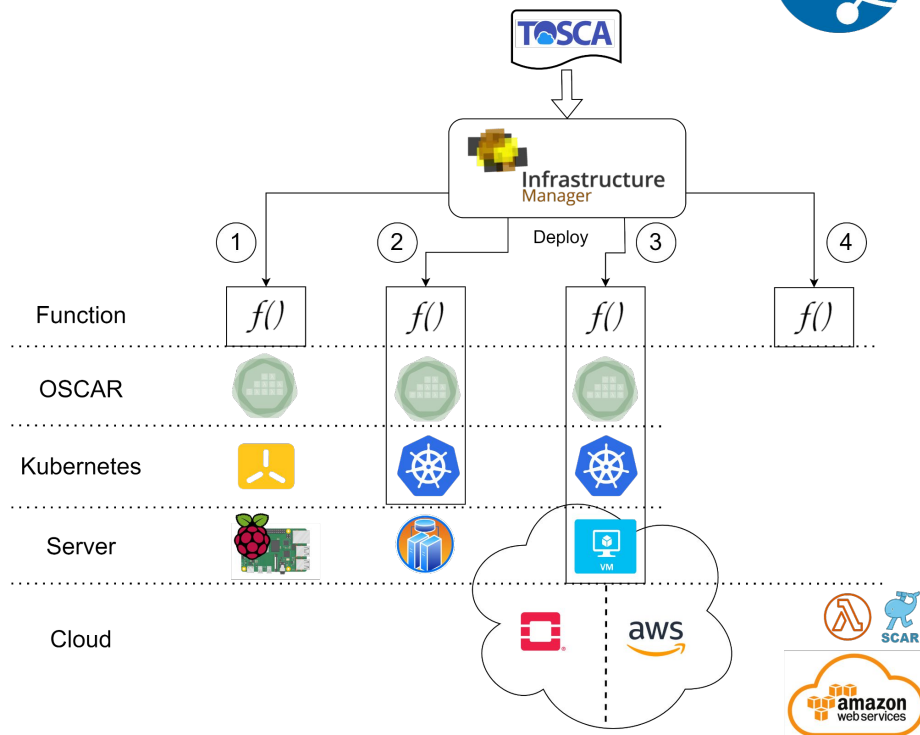
A Decade of Evolution in the IM

Demo: Heterogenous JupyterHub cluster on K8s

- Deploy a JupyterHub service on top of a Kubernetes heterogeneous cluster with GPU support.

More Information

IM Info Web:

https://grycap.upv.es/im/

Video demos in YouTube:

https://youtube.com/playlist?list=PLgPH186Qwh_37AMhEruhVKZSfoYpHkrUp

IM images in Docker Hub and GitHub Container Registry:

https://github.com/grycap/im/pkgs/container/im

https://github.com/grycap/im-dashboard/pkgs/container/im-dashboard

Source Code in GitHub:

https://github.com/grycap/im

https://github.com/grycap/im-dashboard

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