

EOSC Technical Specification

Cloud IaaS VM Orchestration

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DELIVERY SLIP



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TERMINOLOGY

<https://wiki.eosc-hub.eu/display/EOSC/EOSC-hub+Glossary>

Terminology/Acronym	Definition

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Introduction

Services of Cloud IaaS VM Management provide on-demand API-based access to computing resources as Virtual Machines that can run user-defined arbitrary software (including operating systems and applications). Services in this category also allow management of block storage that

can be associated to the VMs and network management to provide connectivity between VMs and external networks.

Adopted standards

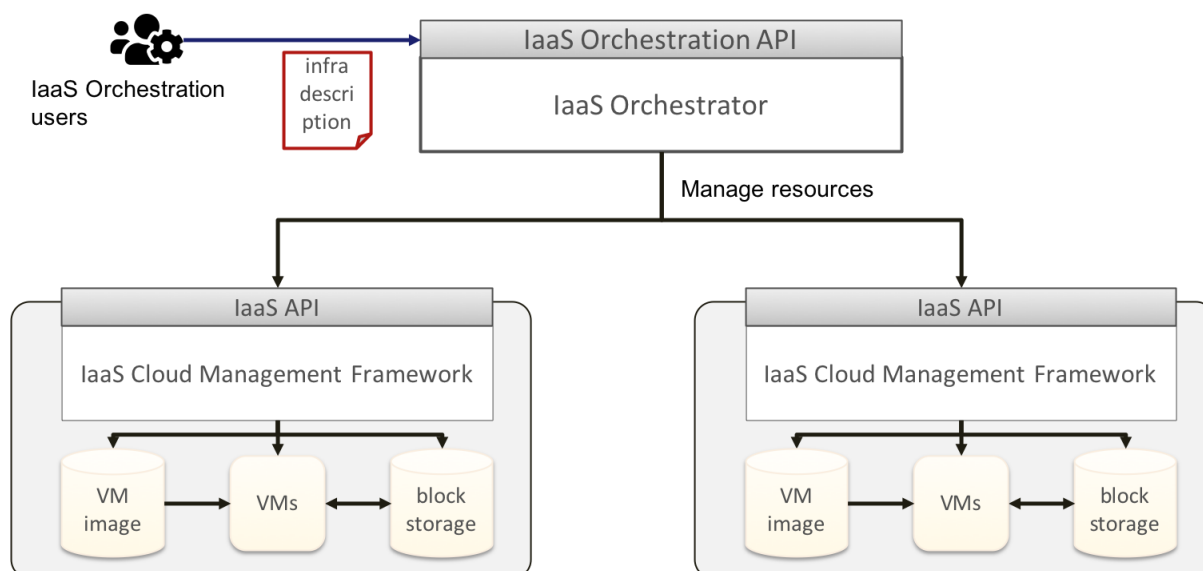
Standard	Short description	References
OASIS TOSCA	Topology and Orchestration Specification for Cloud Applications (TOSCA), is an OASIS standard language to describe a topology of cloud-based web services, their components, relationships, and the processes that manage them.	OASIS TOSCA

There are several competing tools for this block, APIs for this block, most of them proprietary / closed and not interoperable. The table below lists some of the APIs implemented by them, but it's not meant to be an exhaustive list.

Protocol/API	Short description	References
IM	Infrastructure Manager is a tool that eases the access and the usability of IaaS clouds by automating the VMI selection, deployment, configuration, software installation, monitoring and update of Virtual Appliances.	IM REST API
Terraform	Terraform is a tool for building, changing, and versioning infrastructure safely and efficiently. Terraform can manage existing and popular service providers as well as custom in-house solutions.	Terraform documentation
Occopus	Occopus is a framework that provides automatic features for configuring and orchestrating distributed applications (so called virtual infrastructures) on single or multi cloud systems.	Occopus
SlipStream	SlipStream is a multi-cloud application management platform.	SlipStream API

High-level Service Architecture

IaaS Orchestration services build from a code-like description of an application the underlying resources by leveraging IaaS APIs of the target IaaS cloud providers.



Interoperability guidelines

Technical interoperability guidelines

Infrastructure description:

- Interoperable services should support a standard format for the description of the resources to be managed by the orchestrator. OASIS TOSCA is the most widely adopted standard in this area.

AAI interoperability

- Services should provide access to users authenticated with one of the EOSC-hub AAI federated identity protocols (OpenID Connect and/or SAML)

IaaS interoperability

- Services should support APIs listed in the IaaS VM Management macro-feature. At least the APIs supported by current EOSC-hub services (OpenStack, OpenNebula and OCCl) should be supported, ideally proprietary APIs should be also supported to avoid vendor lock-in from the underlying IaaS providers.

Orchestration API

- There is no clear standard or de-facto standard for the orchestration API. No interoperability guidelines are provided.

Examples of solutions implementing this specification

EOSC-hub services:

- [Infrastructure Manager](#)

Other:

- [Terraform](#)
- [Occopus](#)
- [SlipStream](#)

Procedure to integrate a service with the EOSC Hub IaaS Orchestration

IaaS providers willing to be integrated with the EOSC-hub orchestration must provide a compatible IaaS API (OpenStack is the main one, but IM supports several others).

Likewise, new orchestrators willing to be integrated within the EOSC-hub require to support the IaaS APIs offered in EOSC-hub (OpenStack is the main one).