Intercloud Architecture Framework for Interoperability, Federation and Management

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Intercloud Infrastructure/Services Provisioning

(Generic use case: Enterprise/Scientific Workflow deployment on heterogeneous cloud infrastructure)

Multi-layer Cloud Service Model (CSM)

Layer C1 - Physical platform (PC hardware, network, and infrastructure)
Layer C2 - Cloud virtualization layer (e.g. VMware, Xen, KVM or Hyper-V virtualization platforms)
Layer C3 - Cloud virtual resources composition and orchestration layer that is represented by the Cloud Management Software (such as OpenNebula, OpenStack, or others)
Layer C4 - Cloud services layer that may include different type of cloud services IaaS, PaaS, SaaS
Layer C5 - Access/Delivery infrastructure hosting components and functions to provide access to cloud services/resources and interconnect multiple cloud domains
Layer C6 - User/customer side resources and services


Basic Use Cases for Intercloud Interoperability and Integration

Use Case 1: Enterprise IT infrastructure migration to cloud and its evolution
- Integration of the cloud-based components of both cloud service models (such as IaaS, PaaS, SaaS) and other required functional layers and components of the general cloud-based services infrastructure.
- Intercloud Control and Management Plane (ICCP): for Intercloud applications/infrastructure control and management, including inter-applications signaling, synchronization and session management, configuration, monitoring, run time infrastructure optimization including VM migration, resources scaling, and job/objects routing.
- Intercloud Federation Framework (ICFF): to allow independent clouds and related infrastructure components federation of independently managed cloud based infrastructure components belonging to different cloud providers and/or administrative domains, this should support federation at the level of services, business applications, semantics, and namespaces, assuming necessary gateway or federation services.
- Intercloud Operation Framework (ICOF): includes functionalities to support multi-cloud infrastructure operation including business workflow, SLA management, accounting. ICFF defines the basic rules, actors and their relations in sense of resources operation, management and ownership. ICOF requires support from and interacts with both ICCMP and ICFF.

The Intercloud Architecture Framework components

- Multi-layer Cloud Services Model (CSM) for vertical cloud services interaction, integration and compatibility that defines both relations between cloud service models (such as IaaS, PaaS, SaaS) and other required functional layers and components of the general cloud-based services infrastructure.
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General Model and Actors in (Inter)Cloud Federations

(a) Enterprise Infrastructure
(b) Customer Infrastructure
(c) Intercloud Infrastructure

Main Actors in Cloud/Intercloud Federation
- Cloud Service Provider (CSP) is an entity providing cloud based services to customers, on their request and based on the business agreement or SLA, with high degree of self-service and self-management
- Customer is an entity that requests, creates, deploys and manages cloud based services
- User or consumer is an end-user consuming cloud based services
- Cloud Broker is an entity that plays a role of the third party in offering cloud service, adding value of negotiating with CSPs, optionally operating complex multi-provider services
- Identity Provider (IDP) is an entity providing information about identities of all actors in cloud services provisioning
- Direct or Dynamic link

Contributing Projects

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