## **Cloud** **orchestration**

Cloud Orchestration is the process of automating the tasks needed to manage connections and operations of workloads on private and public clouds. Cloud orchestration technologies integrate automated tasks and processes into a workflow to perform specific business functions.

Cloud orchestration tools entail policy enforcement and ensure that processes have the proper permission to execute or connect to a workload. Typical cloud orchestration tasks are to provision or start server workloads, provision storage capacity as needed, and instantiate virtual machines (VMs) by orchestrating services, workloads, and resources in the cloud.

**Impotance of cloud orchestration**

The rapid adoption of containerized, micro-services based applications that communicate via APIs has created the demand for automation of deploying and managing applications across the cloud. This increasing complexity has created the demand for cloud orchestration software that can manage the myriad dependencies across multiple clouds, with policy-driven security and management capabilities.

As organizations increasingly adopt a hybrid cloud architecture, the need for both public cloud orchestration and hybrid cloud orchestration has continued to grow.

Most importantly, cloud orchestration reduces the need for IT staff to manually handle automation tasks, freeing up resources for more productive works. This also reduces the opportunity for manual errors to occur. This lets organizations spend time on innovation, enabling accelerated deployment of applications across hybrid IT infrastructure, orchestrating various processes across domains and systems. The result is an improved experience for users and customers enterprise-wide.

**Benefits of cloud orchestration**

Cloud orchestration simplifies automation across a hybrid cloud environment while ensuring that policies and security protocols are maintained in a dynamic, modern IT environment. Cloud orchestration reduces overall costs while accelerating delivery of services, automates management and coordination of complex hybrid environments, eliminates provisioning errors, and enables self-service provisioning of services without the need for IT intervention.

Cloud orchestration can also help prevent VM sprawl by enhancing the visibility into resource usage across clouds. Other high-level benefits include automating connections between workloads to ensure links are configured properly, and many cloud orchestration platforms do so by the use of a web-based portal that offers single pane of glass management organization-wide.In advanced organizations, developers and line-of-business workers can turn to cloud orchestration software as a self-service mechanism to deploy resources; administrators can use it to track the organization’s reliance on various IT offerings and manage chargebacks.

**Detailed benefits of cloud orchestration include:**

* Improving efficiency of resource utilization, eliminate over-provisioning.
* Monitor, alert, and report on unexpected conditions to diagnose root cause.
* Simplify data integrations and automatically apply policies for governance and security.
* Manage dependencies across clouds to ensure proper execution of tasks.
* Integrate existing identity and access management systems as part of organization-wide security to ensure only authorized users and applications can access or modify automations.
* Eliminate need to build ad-hoc tools when new automations are required.
* Deliver workflow tools for managing and scheduling for IT and line of business users.
* Provide the bridge between clouds or between private and public environments.

**Cloud orchestration model**

Cloud Director orchestration models let you provision a ready environment to deploy virtual servers. Orchestration can be either single cloud or multi-cloud. In a single cloud model, multiple applications run on the same cloud service provider, which is a simpler setup. The more complicated, but also more powerful model is the multi-cloud setup. Here we have multiple applications, which are located on different cloud platforms, and multi-cloud orchestration interconnects them so they can perform as a single system, with the advantage of high redundancy

There are also three delivery models for cloud services in general, Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS)

IaaS is most commonly utilized in cloud orchestration environments. IaaS providers offer network hardware, storage, and servers, as well as physical security in either a dedicated or multi-tenant environment. IaaS providers also offer virtualization services and orchestration tools that can streamline IT operations within their cloud or between multiple clouds.

PaaS providers also provide operating systems and middleware, and SaaS providers deliver applications only, through a web interface, typically on a subscription basis.

Cloud orchestration tools enable all these models to operate as one, providing automation across models and across clouds, but typically taking advantage of IaaS providers to automate the deployment process, reducing labor and resources required so they may focus on bottom-line generating functions.