What's the difference between cloud and virtualization?

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Overview

that allows you to create multiple simulated environments or dedicated resources from a single, physical hardware system, and clouds are IT environments that abstract, pool, and share scalable resources across a network. To put it simply, virtualization is a technology, where cloud is an environment.

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Clouds are usually created to enable cloud computing, which is the act of running workloads within that system.

Cloud infrastructure can include a variety of bare-metal, virtualization, or container software that can be used to abstract, pool, and share scalable resources across a network to create a cloud. At the base of cloud computing is a stable operating system (like Linux®). This is the layer that gives users independence across public, private, and hybrid environments.

If you have intranet access, internet access, or both already established, virtualization can then be used to create clouds, though it’s not the only option.

With virtualization, software called a hypervisor sits on top of physical hardware and abstracts the machine's resources, which are then made available to virtual environments called virtual

machines. These resources can be raw processing power, storage, or cloud-based applications containing all the runtime code and resources required to deploy it.

If the process stops here, it's not cloud—it's just virtualization.

Virtual resources need to be allocated into centralized pools before they're called clouds. Adding a layer of management software gives administrative control over the infrastructure, platforms, applications, and data that will be used in the cloud. An automation layer is added to replace or reduce human interaction with repeatable instructions and processes, which provides the self-service component of the cloud.

You've created a cloud if you've set up an IT system that:

- Can be accessed by other computers through a network.
- Contains a repository of IT resources.
- Can be provisioned and scaled quickly.

Clouds deliver the added benefits of self-service access, automated infrastructure scaling, and dynamic resource pools, which most clearly distinguish it from traditional virtualization.

Virtualization has its own benefits, such as server consolidation and improved hardware utilization, which reduces the need for power, space, and cooling in a datacenter. Virtual machines are also isolated environments, so they are a good option for testing new applications or setting up a production environment.

A practical comparison

Virtualization can make 1 resource act like many, while cloud computing lets different departments (through private cloud) or companies (through a public cloud) access a single pool of automatically provisioned resources.

Virtualization

Virtualization is technology that allows you to create multiple simulated environments or dedicated resources from a single, physical hardware system. Software called a hypervisor connects directly to that hardware and allows you to split 1 system into separate, distinct, and secure environments known as

Cloud Computing

Cloud computing is a set of principles and approaches to deliver compute, network, and storage infrastructure resources, services, platforms, and applications to users on-demand across any network. These infrastructure resources, services, and applications are sourced from clouds, which are pools of

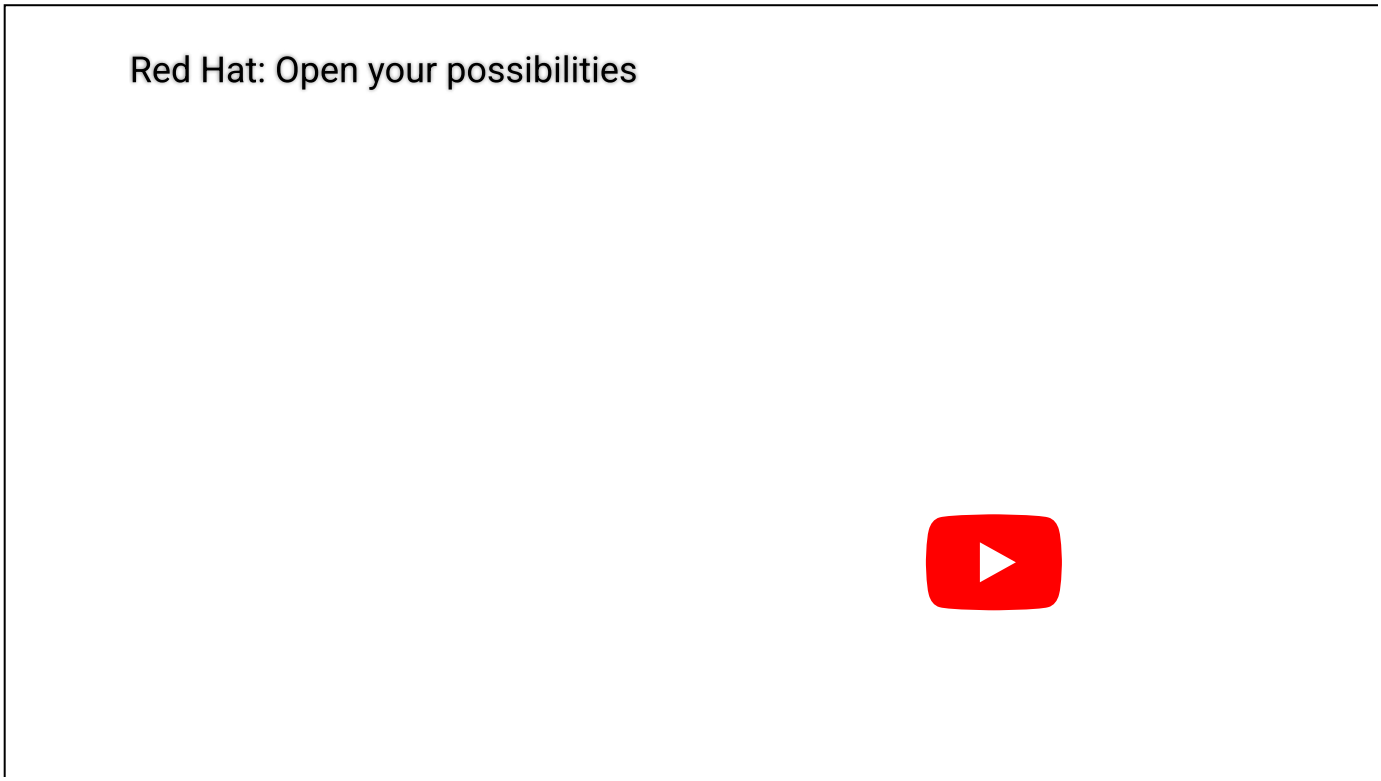
virtual machines (VMs). These VMs rely on the hypervisor's ability to separate the machine's resources from the hardware and distribute them appropriately.	virtual resources orchestrated by management and automation software so they can be accessed by users on-demand through self-service portals supported by automatic scaling and dynamic resource allocation.

Definition	
Technology	
Methodology	
Purpose	
Create multiple simulated environments from 1 physical hardware system	
Pool and automate virtual resources for on-demand use	
Use	
Deliver packaged resources to specific users for a specific purpose	
Deliver variable resources to groups of users for a variety of purposes	
Configuration	
Image-based	
Template-based	
Lifespan	
Years (long-term)	
Hours to months (short-term)	

Cost	
High capital expenditures (CAPEX), low operating expenses (OPEX)	
Private cloud: High CAPEX, low OPEX Public cloud: Low CAPEX, high OPEX	
Scalability	
Scale up	
Scale out	
Workload	
Stateful	
Stateless	
Tenancy	
Single tenant	
Multiple tenants	

Learn more about the differences →

How do I move from virtualization to cloud computing?



If you already have a virtual infrastructure, you can create a cloud by pooling virtual resources together, orchestrating them using management and automation software, and creating a self-service portal for users—or you can let something like Red Hat® OpenStack® Platform do a lot of that work for you. But moving from virtualization to cloud computing isn't that simple when you're bound to a vendor's enterprise-license agreement, which might limit your ability to invest in modern technologies like clouds, containers, and automation systems.

Migrate your virtual infrastructure first →

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