

Virtualization

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OVERVIEW HOW VIRTUALIZATION WORKS TYPES OF VIRTUALIZATION RESOURCES

What is Virtualization?

Virtualization is the process of creating a software-based, or virtual, representation of something, such as virtual applications, servers, storage and networks. It is the single most effective way to reduce IT expenses while boosting efficiency and agility for all size businesses.



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Benefits of Virtualization

Virtualization can increase IT agility, flexibility and scalability while creating significant cost savings. Greater workload mobility, increased performance and availability of resources, automated operations – they're all benefits of virtualization that make IT simpler to manage and less costly to own and operate. Additional benefits include:

- Reduced capital and operating costs.
- Minimized or eliminated downtime.
- Increased IT productivity, efficiency, agility and responsiveness.
- Faster provisioning of applications and resources.
- Greater business continuity (https://www.vmware.com/topics/glossary/content/business-continuity) and disaster recovery.
- Simplified data center management.
- Availability of a true Software-Defined Data Center..

HOW VIRTUALIZATION WORKS

Virtualization 101

<https://www.vmware.com/solutions/virtualization.html>

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Due to the limitations of x86 servers, many IT organizations must deploy multiple servers, each operating at a fraction of their capacity, to keep pace with today's high storage and processing demands. The result: huge inefficiencies and excessive operating costs.

Enter virtualization. Virtualization relies on software to simulate hardware functionality and create a virtual computer system. This enables IT organizations to run more than one virtual system – and multiple operating systems and applications – on a single server. The resulting benefits include economies of scale and greater efficiency.

Virtual Machines Explained

A virtual computer system is known as a “virtual machine” (VM): a tightly isolated software container with an operating system and application inside. Each self-contained VM is completely independent. Putting multiple VMs on a single computer enables several operating systems and applications to run on just one physical server, or “host.”

A thin layer of software called a “hypervisor (<https://www.vmware.com/topics/glossary/content/hypervisor>)” decouples the virtual machines from the host and dynamically allocates computing resources to each virtual machine (<https://www.vmware.com/topics/glossary/content/virtual-machine>) as needed.

Key Properties of Virtual Machines

VMs have the following characteristics, which offer several benefits.

Partitioning

- Run multiple operating systems on one physical machine.
- Divide system resources between virtual machines.

Isolation

- Provide fault and security isolation at the hardware level.
- Preserve performance with advanced resource controls.

Encapsulation

- Save the entire state of a virtual machine to files.
- Move and copy virtual machines as easily as moving and copying files.

Hardware Independence

- Provision or migrate any virtual machine to any physical server.

Types of Virtualization

Server Virtualization

Server virtualization (<https://www.vmware.com/topics/glossary/content/server-virtualization>) enables multiple operating systems to run on a single physical server as highly efficient virtual machines. Key benefits include:

- Greater IT efficiencies
- Reduced operating costs
- Faster workload deployment
- Increased application performance
- Higher server availability
- Eliminated server sprawl and complexity

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Test-Drive vSphere for Free ([/go/trv-vsphere-hol](http://go/trv-vsphere-hol))

Network Virtualization

By completely reproducing a physical network, network virtualization ([/products/nsx.html](https://products.vmware.com/network-virtualization)) allows applications to run on a virtual network as if they were running on a physical network — but with greater operational benefits and all the hardware independencies of virtualization. (Network virtualization (<https://www.vmware.com/topics/glossary/content/network-virtualization>) presents logical networking devices and services — logical ports, switches, routers, firewalls, load balancers, VPNs and more — to connected workloads.)

Learn More About Network Virtualization with NSX ([/products/nsx.html](#))

Test-Drive NSX for Free (/products/nsx/nsx-hol.html)

Desktop Virtualization (/products/desktop-virtualization.html)

Deploying desktops as a managed service enables IT organizations to respond faster to changing workplace needs and emerging opportunities.

Virtualized desktops and applications can also be quickly and easily delivered to branch offices, outsourced and offshore employees, and mobile workers using iPad and Android tablets.

Learn More About Desktop Virtualization with Horizon ([/products/horizon.html](#))

Test-Drive Horizon for Free ([/products/horizon/horizon-hol.html](http://products/horizon/horizon-hol.html))

Virtualization vs. Cloud Computing

Although equally buzz-worthy technologies, virtualization and cloud computing are not interchangeable. Virtualization is software that makes computing environments independent of physical infrastructure, while cloud computing is a service that delivers shared computing resources (software, hardware, and services) on-demand via the Internet. As complementary solutions, organizations can begin by virtualizing their servers and then moving to a cloud-based architecture.

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What is virtualization technology & virtual machine? | VMware

on demand via the Internet. As complementary solutions, organizations can begin by virtualizing their servers and then moving to cloud computing for even greater agility and self-service.

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- NSX in Focus The University of New Mexico (<https://www.youtube.com/watch?v=nwR5soSXjW8>)
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