

DATA CENTRE VIRTUALISATION (ACUA6001_LON)

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WHAT ARE THE BENEFITS OF VIRTUALIZATION?

- ❖ Significantly reduces capital and operating costs.
- ❖ Minimizes or eliminates downtime.
- ❖ Increases information technology (IT) efficiency, productivity, agility and responsiveness.
- ❖ Enables faster provisioning of resources and applications.
- ❖ Provides disaster recovery and greater business continuity.
- ❖ Simplifies data center management.

What is VMware?

VMware is a California based company founded in 1998 that specializes in **providing a platform for the virtualization of IT infrastructure.**



VMware now has a major presence in:



Private Data
Centers



Cloud Management
Services



Virtualized Storage
and Networking



Desktop
Software

VMWARE

VMware is a virtual machine software which extends the trusted infrastructure and operations proven in the data centre for more than 20 years. This consistent environment is available globally, enabling seamless portability of workloads and a single set of operations, skills, tools, and policies from the data centre to the cloud to the edge.

VMware Vision

The Essential, Ubiquitous Digital Foundation

Any Device



Any Application



Any Cloud



VMware Hyper Converged Infrastructure (HCI)

A more recent trend of VMware has been to virtualize more hardware-based datacenter features into its products.



Since the release of vSphere 5.0 in 2014, VMware has offered 2 products aimed at



Virtualizing the Storage



Network Fabrics of a Datacenter

Traditionally, datacenters would consist of several ESXi hosts, various storage devices (SAN) and associated SAN Switches, as well as the network infrastructure layer. VMware vSAN and VMware NSX provide a storage virtualization layer and a network virtualization layer in what VMware calls a **hyper-converged infrastructure**.



WINDOWS VMS

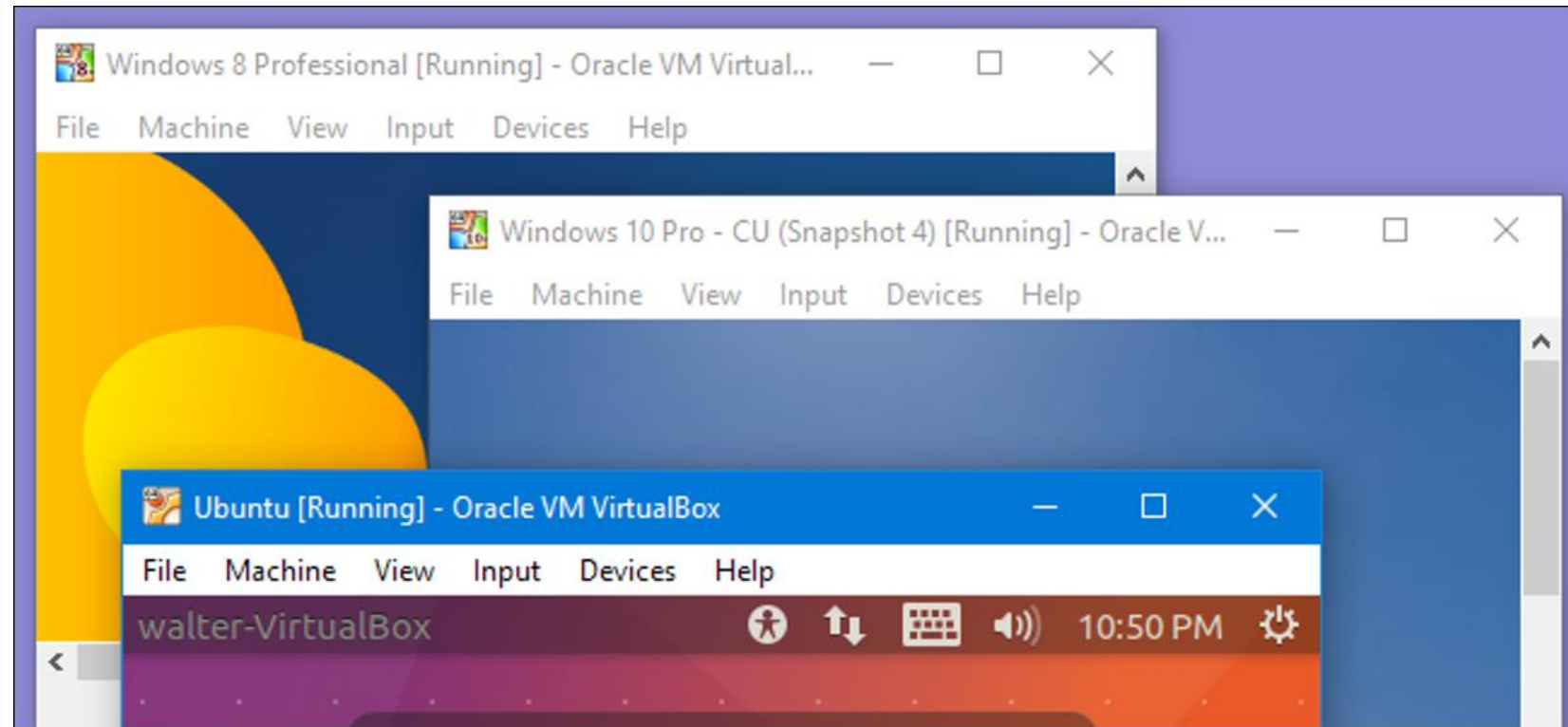
What's a Virtual Machine?

- ❑ A virtual machine app creates a virtualized environment, called simply enough, a virtual machine, that behaves like a separate computer system, complete with virtual hardware devices.
- ❑ In the VM world, the operating system actually running on your computer is called the host and any operating systems running inside VMs are called guests. It helps keep things from getting too confusing.
- ❑ Virtual machines allow you to run an operating system in an app window on your desktop that behaves like a full, separate computer. You can use them play around with different operating systems, run software your main operating system can't, and try out apps in a safe, sandboxed environment.

Reasons to use virtualization

Virtualization allows you to:

- Run software that requires an older version of Windows or non-Windows operating systems.
- Experiment with other operating systems.
- Test software on multiple operating systems using multiple virtual machines.



AZURE

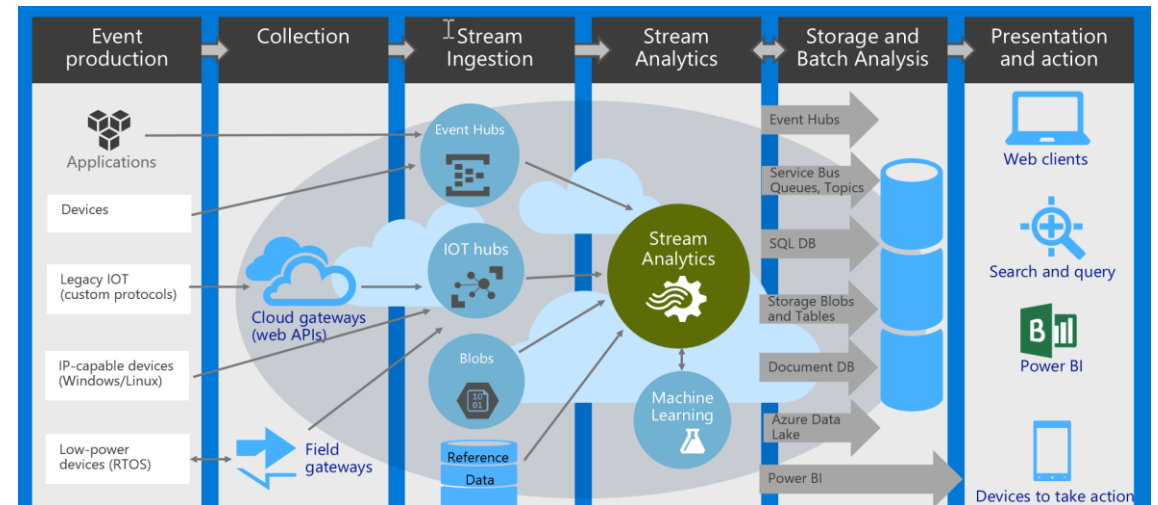
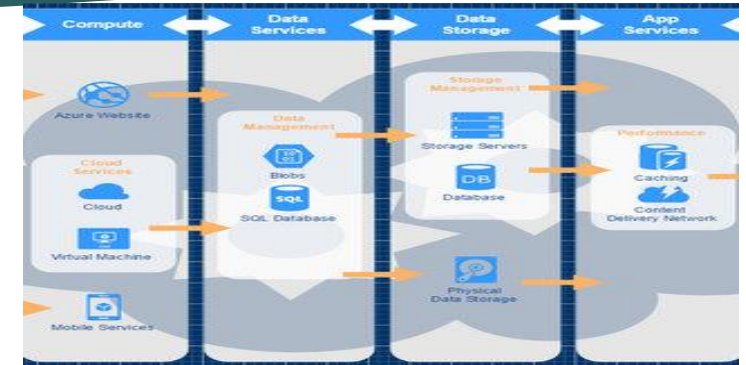
The Azure cloud platform and cloud services is designed to help and bring new solutions to life. You can build, run, and manage applications across multiple clouds, on-premises, and at the edge, with the tools and frameworks of your choice.

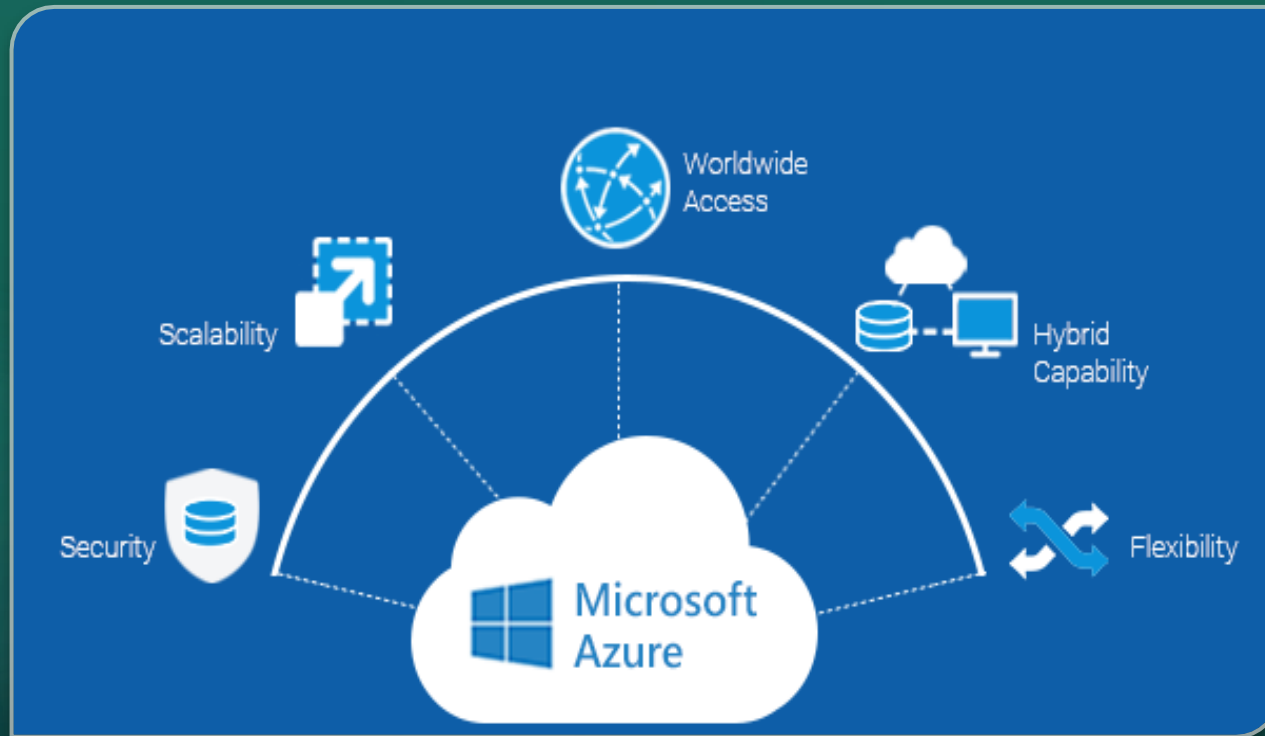
```
mirror_mod = modifier_ob.  
#set mirror object to mirror  
mirror_mod.mirror_object =  
operation == "MIRROR_X":  
mirror_mod.use_x = True  
mirror_mod.use_y = False  
mirror_mod.use_z = False  
operation == "MIRROR_Y":  
mirror_mod.use_x = False  
mirror_mod.use_y = True  
mirror_mod.use_z = False  
operation == "MIRROR_Z":  
mirror_mod.use_x = False  
mirror_mod.use_y = False  
mirror_mod.use_z = True  
  
#selection at the end -add  
mirror_ob.select= 1  
modifier_ob.select=1  
context.scene.objects.active  
("Selected" + str(modifier_ob.  
mirror_ob.select = 0  
= bpy.context.selected_object  
data.objects[one.name].select  
  
print("please select exactly  
  
-- OPERATOR CLASSES --  
  
types.Operator):  
X mirror to the selected  
object.mirror_mirror_x"  
mirror X"  
  
context):  
context.active_object is not
```

Azure provides solutions for all industries, through proven combinations of cloud products and services.

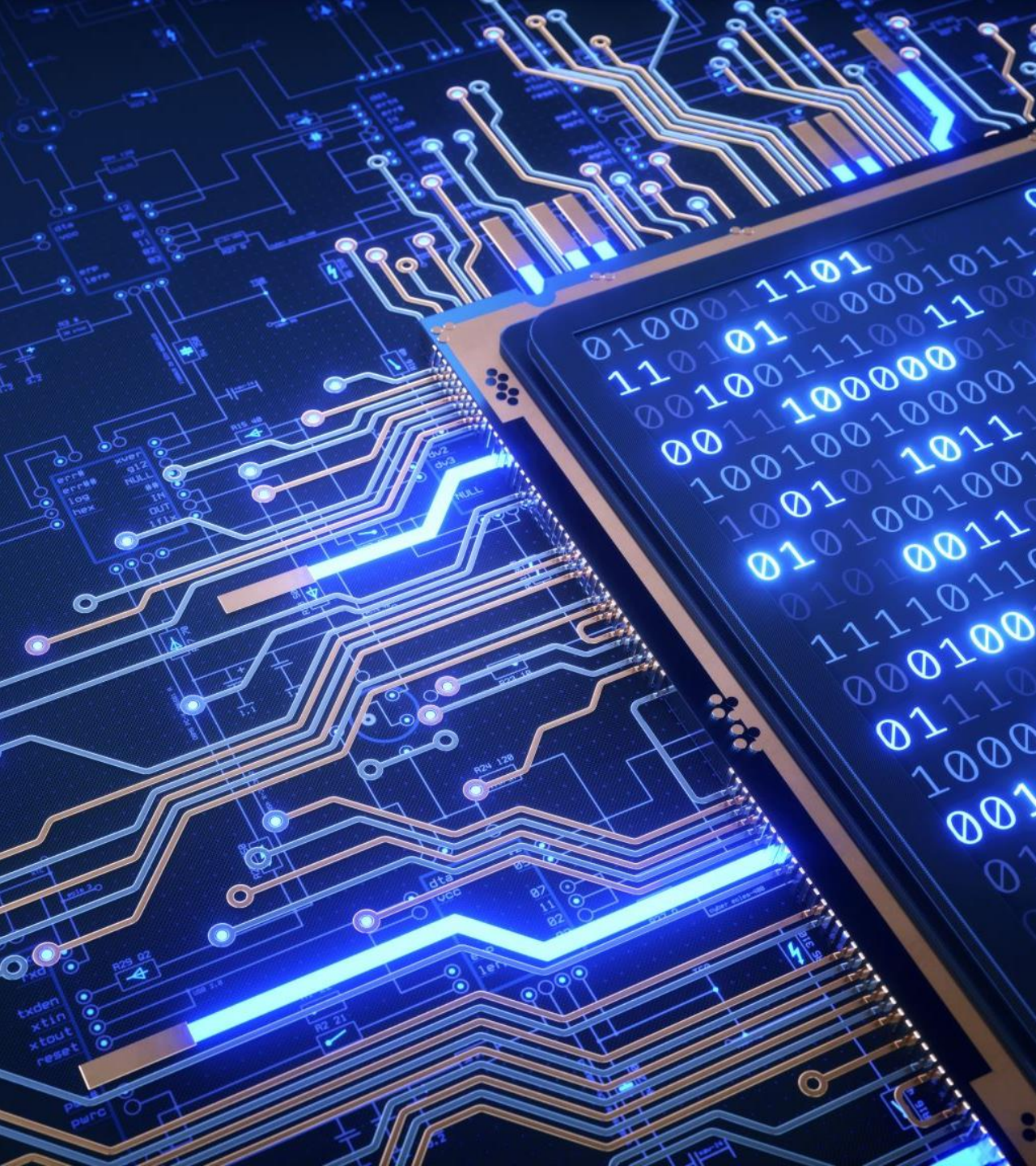
Advantages of using Azure

- ▶ Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) capabilities
- ▶ Security Development Lifecycle (SDL)
- ▶ Scalability and Ductility
- ▶ Unmatched Hybrid Capabilities
- ▶ Integrated Environment with Other Microsoft Tools
- ▶ Analytics and Intelligence capabilities
- ▶ Cost Efficient Platform
- ▶ Interoperability
- ▶ Identity & Access Management (IAM)





Azure is the only consistent hybrid cloud which delivers unparalleled developer productivity, provides comprehensive multi-layered security, including the largest compliance coverage of any cloud provider.



CITRIX

Citrix is a multinational cloud computing and virtualization technology company that provides server, application and desktop virtualization, networking and cloud computing technologies.

CITRIX ARCHITECTURE

The new Citrix architecture is called FlexCast Management Architecture (FMA).

The FMA architecture is build up of five layers:

1. User Layer

This layer focus is on logistics of user groups, such as client software, type of end point and location.

2. Access Layer

This layer defines how users authenticate to gain access to their resources, secure their communications with the resource layer and deliver applications to the users end points.

3. Resource Layer

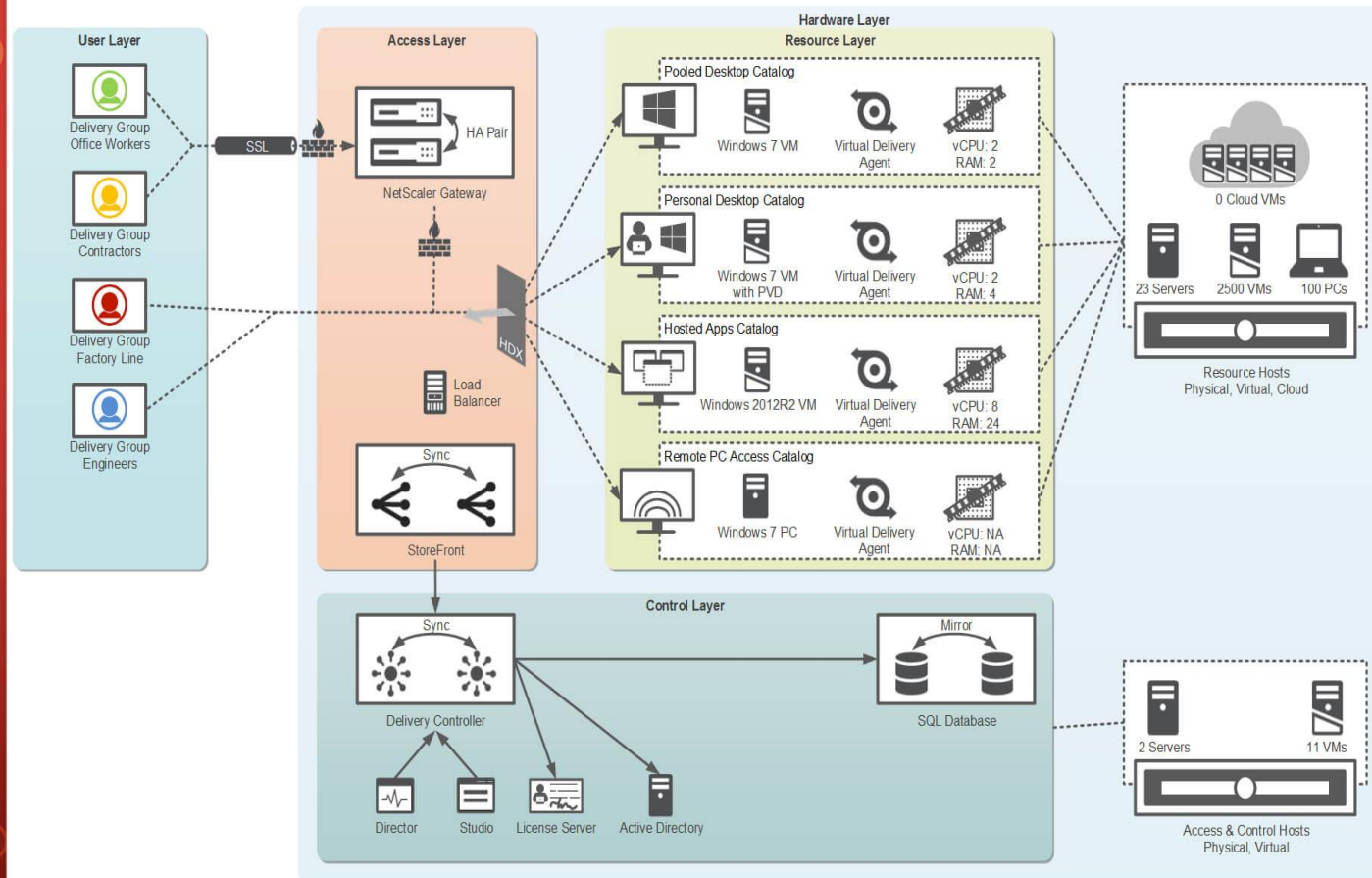
Resource here refers to the Desktops and Applications you intend to deliver to the end user

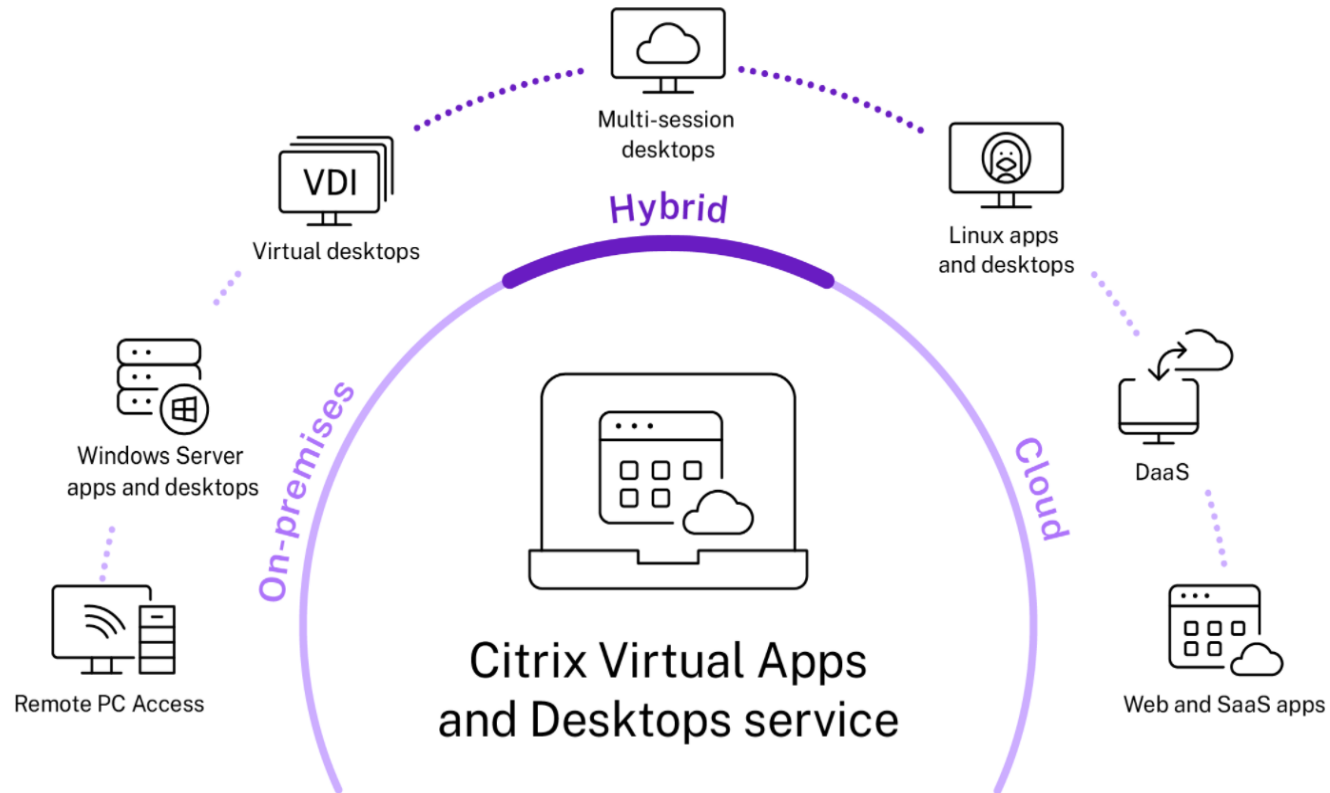
4. Control Layer

The purpose of the control layer is to provide servers/devices to support the user layers.

5. Hardware Layer

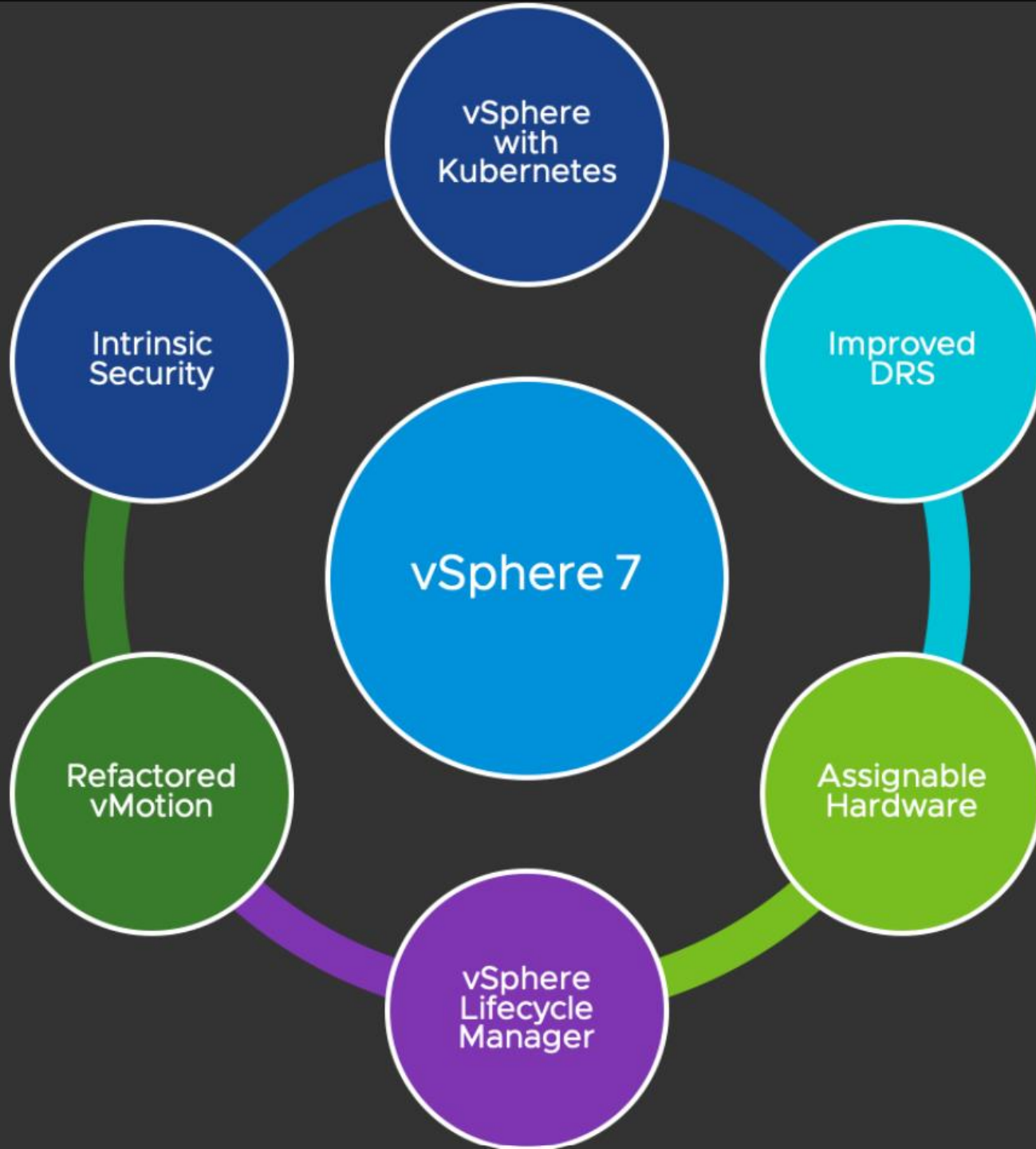
This is the physical layer that is responsible for the support of the XenDesktop solution





Citrix provide technical products for virtualization with it's virtual desktop infrastructure (VDI) and desktop as a service (DaaS), being two of it's most popular product.

DaaS and VDI capabilities provide corporate data protection as well as an easily accessible hybrid work solution for employees. Because all data is stored securely in the cloud or datacenter, rather than on devices, end-users can work securely from anywhere, on any device, and over any network—all with a fully IT-provided experience. IT also gains the benefit of centralized management, so they can scale their environments quickly and easily. By separating endpoints and corporate data, resources stay protected even if the devices are compromised.



VSPHERE 7.0

vSphere 7.0 is a server virtualization software.

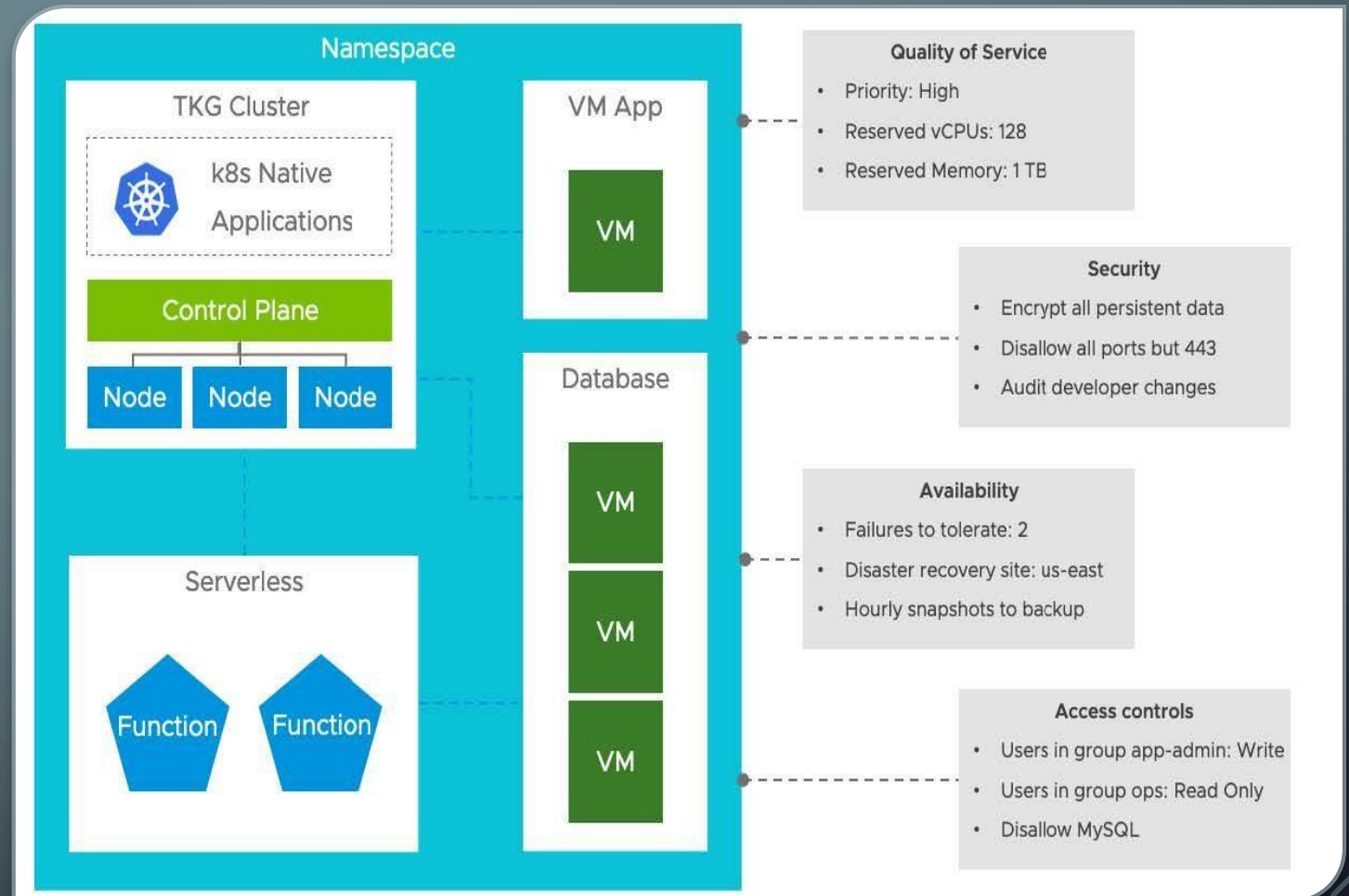
Server virtualization is the process of dividing a physical server into multiple unique and isolated virtual servers by means of a software application. Each virtual server can run its own operating systems independently.

Three Types of Server Virtualization:

1. Full Virtualization: Full virtualization uses a hypervisor
2. Para-Virtualization: Unlike full virtualization, para-virtualization involves the entire network working together as a cohesive unit.
3. OS-Level Virtualization: Unlike full and para-virtualization, OS-level virtualization does not use a hypervisor. Instead, the virtualization capability, which is part of the physical server operating system, performs all the tasks of a hypervisor. However, all the virtual servers must run that same operating system in this server virtualization method.

Benefits of Server Virtualization:

- Higher server ability
- Cheaper operating costs
- Eliminate server complexity
- Increased application performance
- Deploy workload quicker



MICROSOFT HYPER-V

Hyper-V is Microsoft's hardware virtualization product. It lets you create and run a software version of a computer, called a virtual machine.

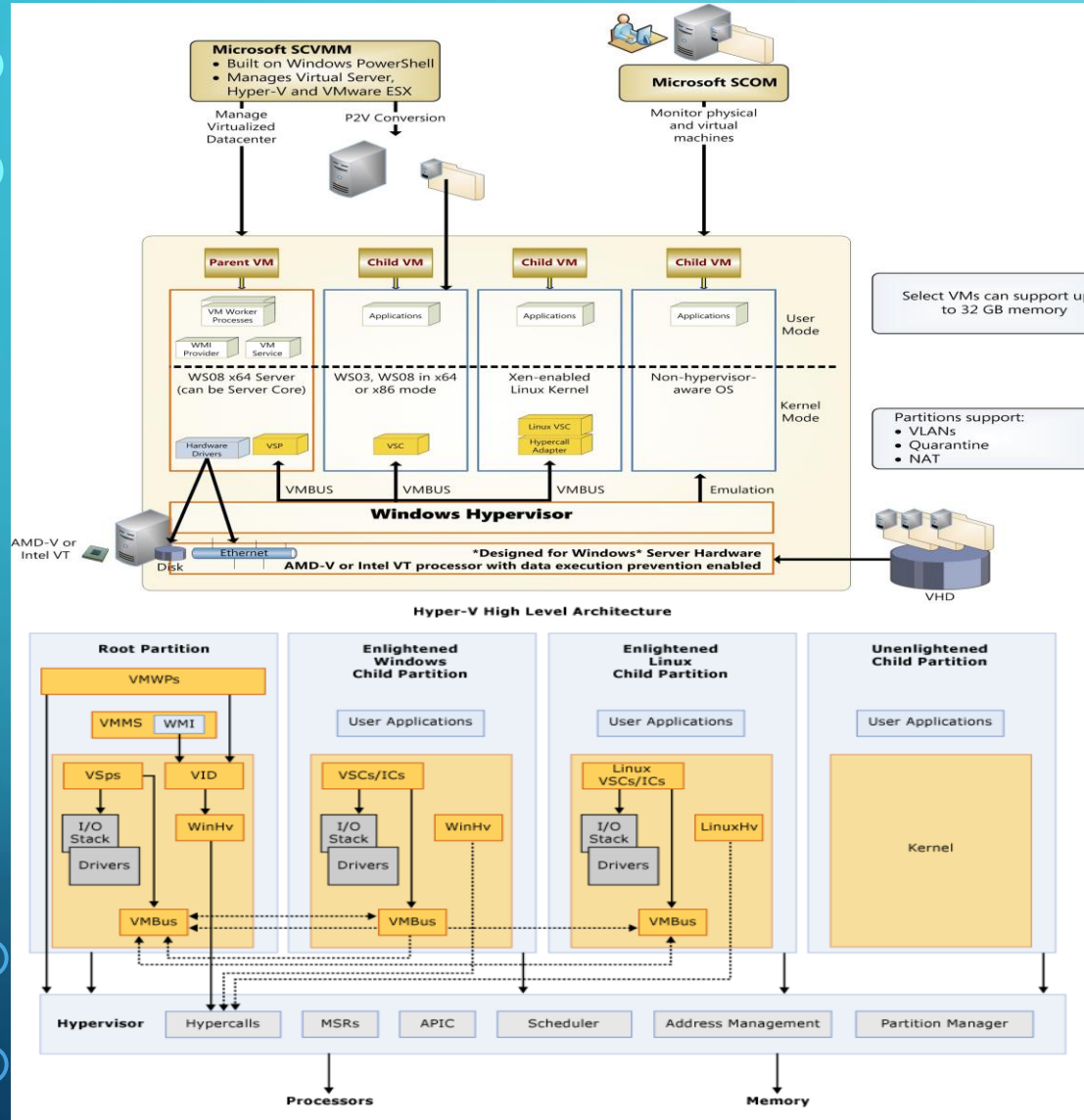
Hyper-V runs each virtual machine in its own isolated space, which means you can run more than one virtual machine on the same hardware at the same time.

The hypervisor manages the interactions between the hardware and the virtual machines. This hypervisor-controlled access to the hardware gives virtual machines the isolated environment in which they run. In some configurations, a virtual machine or the operating system running in the virtual machine has direct access to graphics, networking, or storage hardware.

Hyper-V has required parts that work together so you can create and run virtual machines. Together, these parts are called the virtualization platform. The required parts include Windows hypervisor, Hyper-V Virtual Machine Management Service, the virtualization WMI provider, the virtual machine bus (VMBus), virtualization service provider (VSP) and virtual infrastructure driver (VID).

Benefits of Hyper-V

- Establish or expand a private cloud environment
- Use your hardware more effectively
- Improve business continuity
- Establish or expand a virtual desktop infrastructure (VDI)
- Make development and test more efficient



HYPER-V VS VSPHERE

Hyper-V is built on a microkernelized design, so the device drivers run and operate independently in the Controlling Layer

Hyper-V Advantages

- Minimal device driver management
- A wide range of compatible devices
- New server roles are easy to install
- Shorter initialization time
- High resilience to corrupt external code
- Zero downtime to perform maintenance or apply security updates
- Readily scalable services

Hyper-V Disadvantages

- A crash of the primary OS will crash all VMs
- OS must be installed in order for the Hypervisor Layer to operate
- Frequent OS and security updates translate into more overhead
- Lack of support for service templates

vSphere uses a Monolithic Hypervisor Design, in which the device drivers are an integral part of the Hypervisor Layer.

VMware Advantages

- No operating system is necessary for controlling the management components
- No security patches necessary for Controlling Layer components
- Excellent vendor support
- Out-of-the-box governance feature set
- Available AWS apps

VMware Disadvantages

- Incompatibility with hardware that VMware doesn't support
- Complex device drivers will slow the initialization time
- Steep learning curve
- Corrupt external code may slow initialization or hang a server
- Trial software missing some functionality

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