VIR1

- CPNV – ES
- Software development orientation
- 4th quarter - 2022-2023

- Glassey Nicolas

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What is Virtualization ?

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What is Virtualization ?

Create a software-based-or virtual-representation of applications, servers, storage and network to reduce IT expenses while boosting efficiency and agility.

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What is Virtualization ?

- Virtual software mimics the functions of physical hardware to run multiple virtual machines simultaneously on a single physical machine.
- Businesses use virtualization to use their hardware resources efficiently and get greater returns from their investment.
- It also powers cloud computing services that help organizations manage infrastructure more efficiently.

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Characteristics of hypervisors ?

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Characteristics of hypervisors ?

- **Performance**:

✓ Directly access to the hardware resources

✓ In a bare-metal situation, the guest OS performance should close to native speeds

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Characteristics of hypervisors ?

- **Ecosystem**:

✓ Documentation and technical support to implement and manage hypervisor (in case of scale across multiples physical servers).

✓ Look for a healthy community that can provide support with agent, plugins that offer capabilities (backup/restore, fail-over)

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Characteristics of hypervisors ?

- **Management tools**:

✓ Launching and Running VM's is only the start point…

✓ VM's need to be:
  - ✓ Provisioned
  - ✓ Maintained
  - ✓ Audited
  - ✓ Clean up (to prevent "VM sprawl" (proliferation in French)

✓ Ensured that the vendor supports the hypervisor architecture with comprehensive management tools.

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Characteristics of hypervisors ?

- **Live migration**:

✓ Enable you to move VMs between hypervisors.

✓ Fail-over solution.

✓ Workload balancing.

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Characteristics of hypervisors ?

- **Cost**:

✓ Do not consider only the cost of the Hypervisor.

✓ Saving of human resources (less maintenance load).

✓ Reduces the number of physical machines to be maintained, replaced and replicated.

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Type of Virtualization ?

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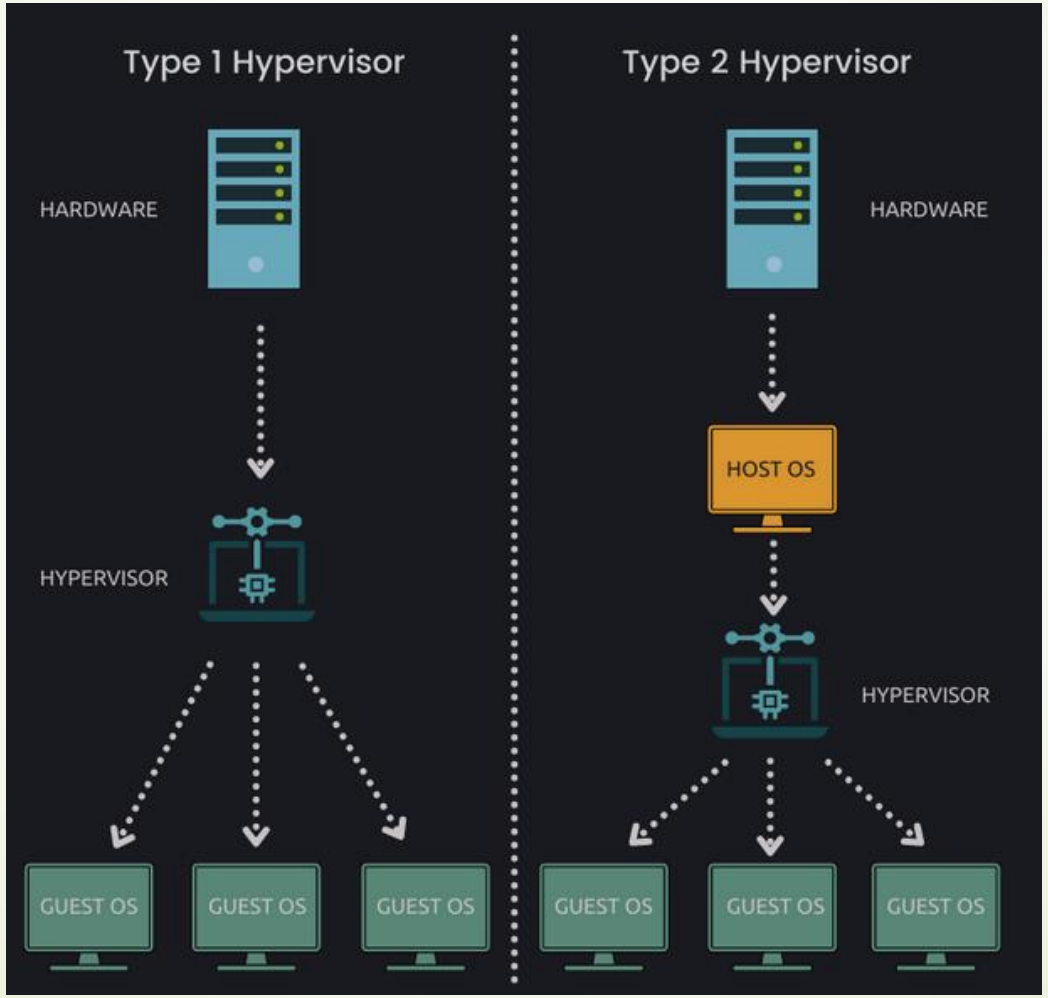
Type of Virtualization ?



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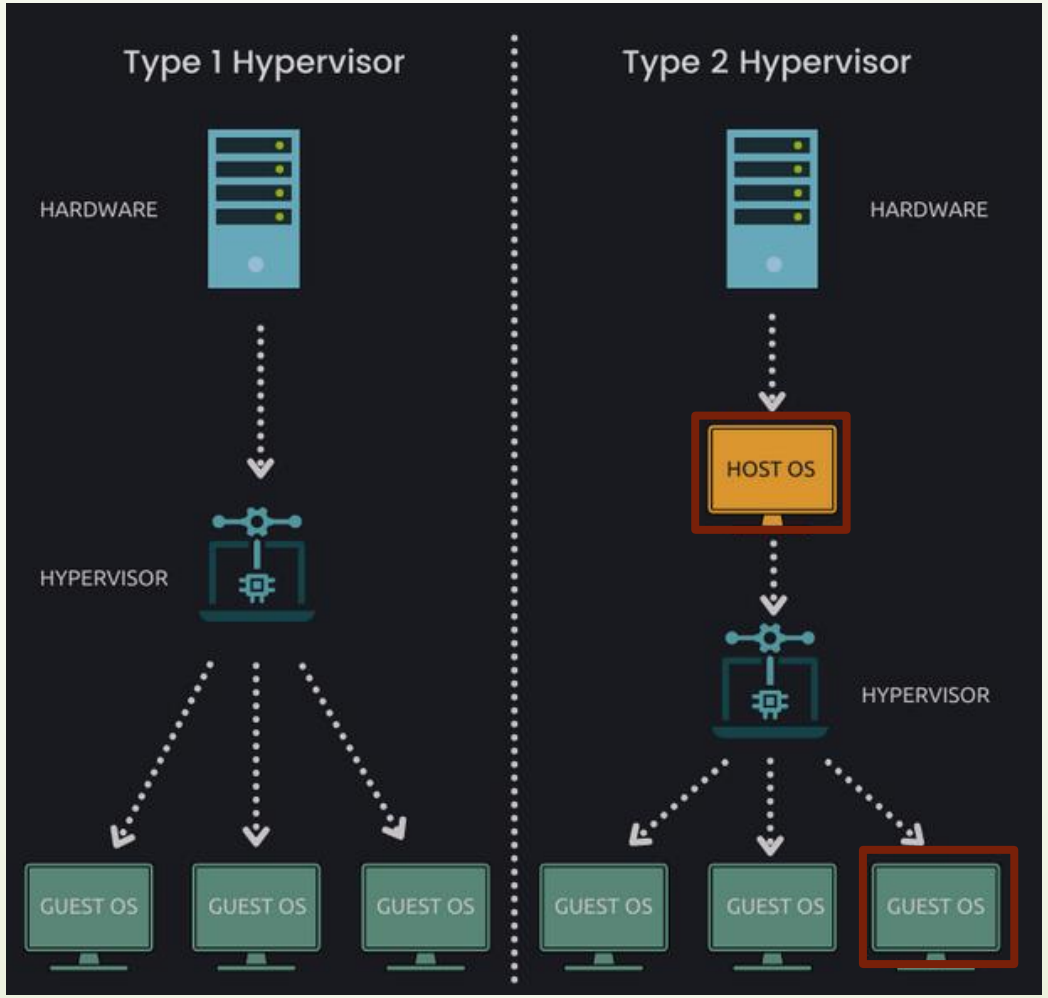

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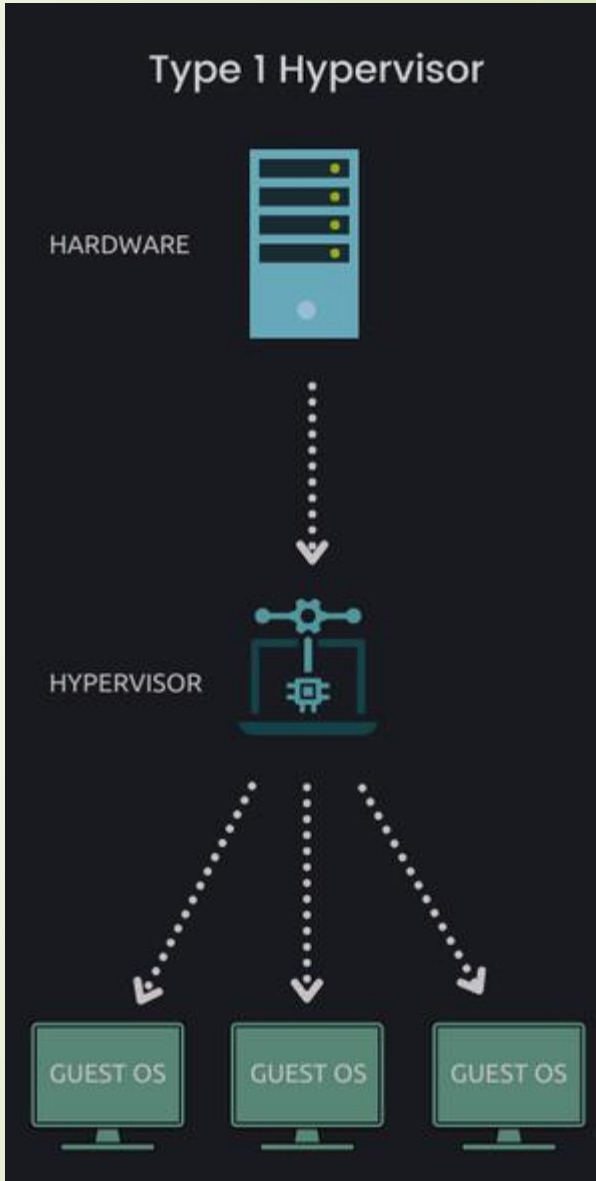
Type of Virtualization ?

- Hypervisor - Type I

  - ✓ ESXi (VMware vSphere)
  - ✓ Hyper-V (Microsoft)
  - ✓ Open source alternatives (KVM, Xen hypervisor)
  - ✓ Oracle Vm (based on Xen)
  - ✓ Citrix Hypervisor (based on Xen)



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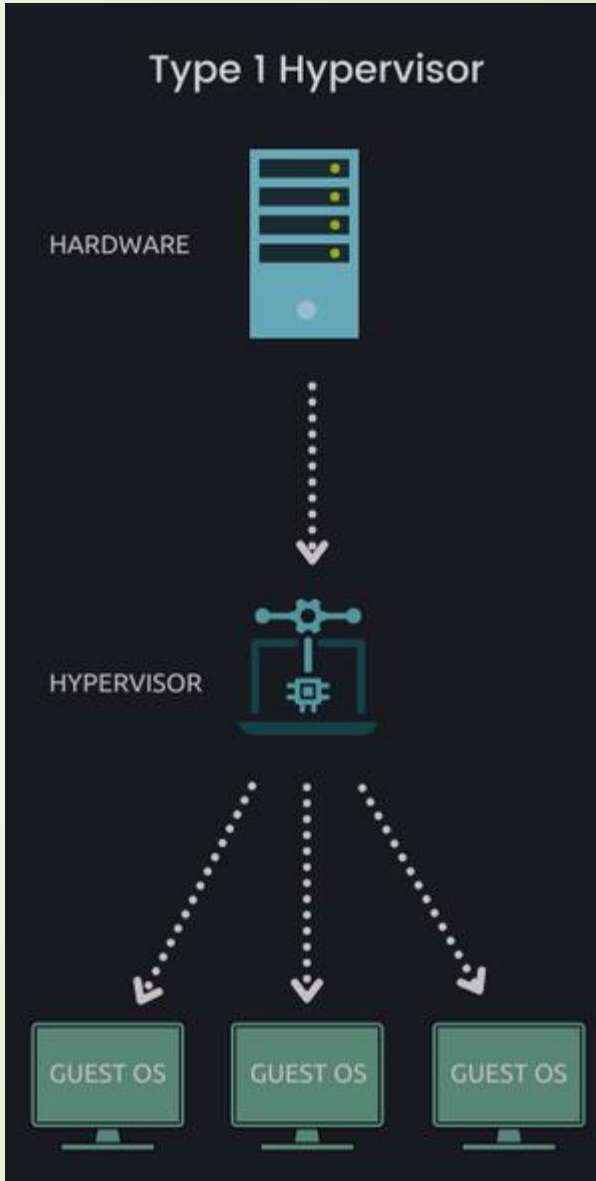
Type of Virtualization ?

- Hypervisor - Type I – Key pointers

- ✓ Directly installed on a bare-metal system or physical host.
- ✓ OS installation is not a requirement before installing the Hypervisor itself.
- ✓ Direct access to hardware (CPU, RAM, Network).
- ✓ Better security (absence of any extra layer).
- ✓ 1 Hypervisor = 1 Dedicated physical machine.



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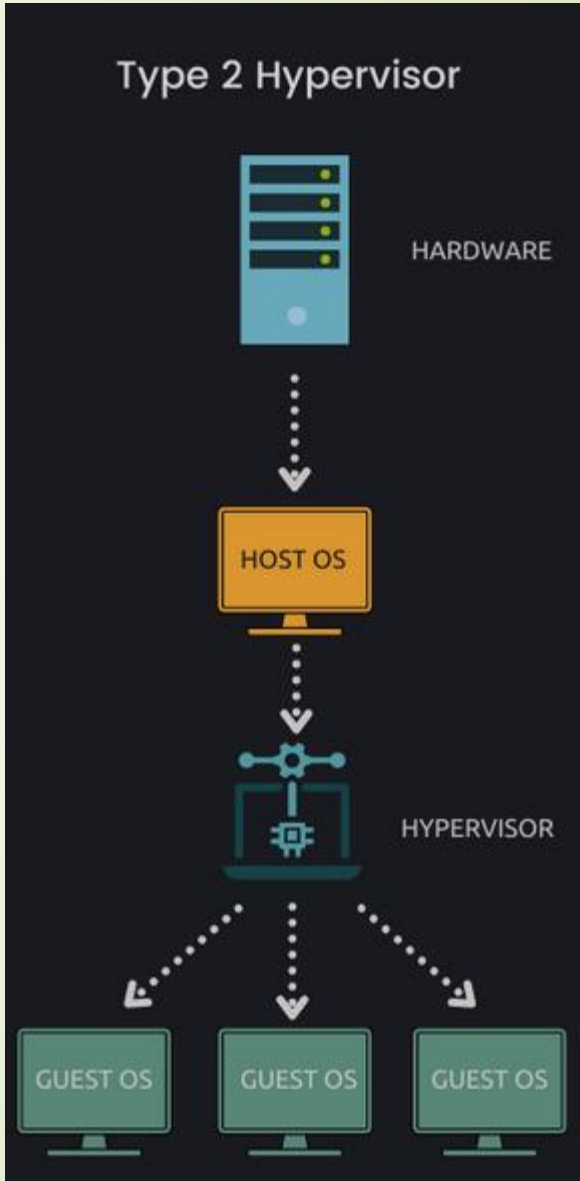
Type of Virtualization ?

- Hypervisor - Type II

- ✓ Virtual Box (Oracle) – Open Source
- ✓ Workstation and Fusion (VMware)
- ✓ QEMU
- ✓ Parallels Desktop



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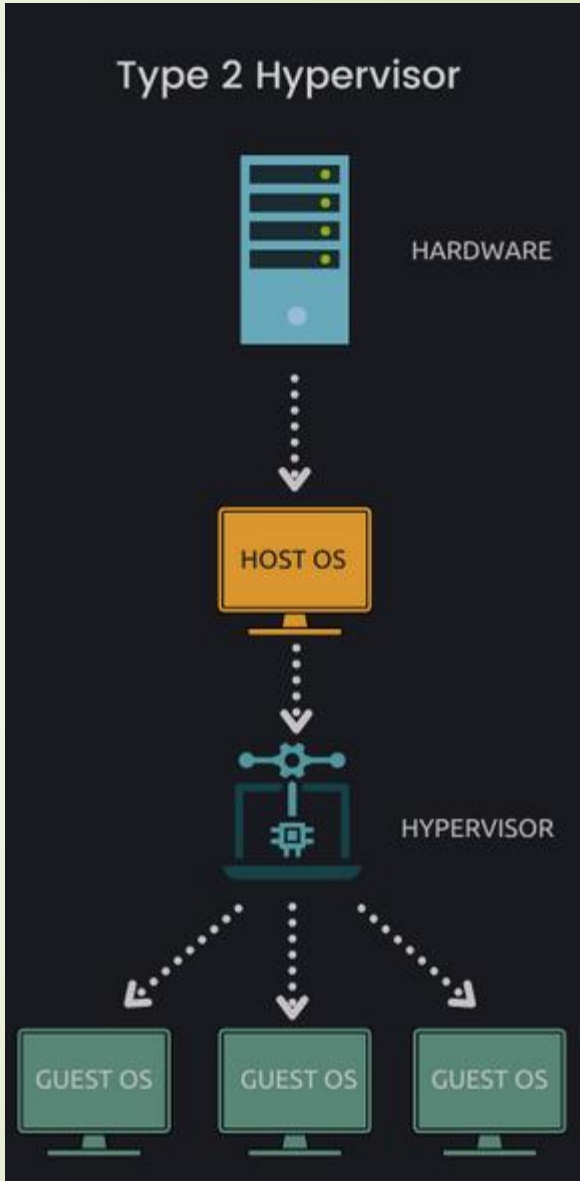
Type of Virtualization ?

- Hypervisor - Type II – Key pointers

- ✓ Not Directly installed on a bare-metal system or physical host.
- ✓ OS installation is a requirement before installing the Hypervisor itself.
- ✓ Indirect access to hardware (CPU, RAM, Network).
- ✓ Can cost less and suitable more small business solutions.
- ✓ N Hypervisors on 1 Dedicated physical machine.



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Benefits of virtualization ?

- Virtualization offers substantial benefits for just about any business or development environment.
- It has become a core strategy for improving IT efficiency (agility).

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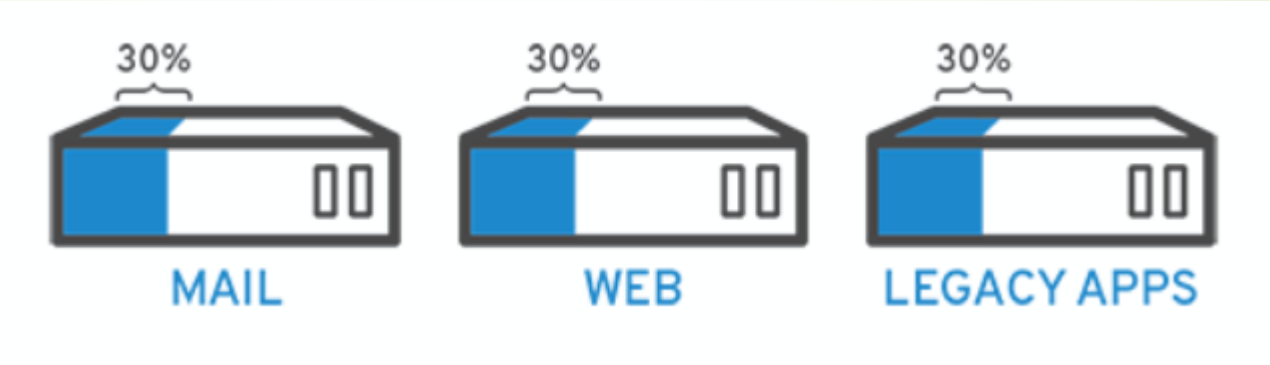
Benefits of virtualization ?

- Reduced expenses

✓ If the only way to get more resources is to purchase new hardware, that price becomes hefty.



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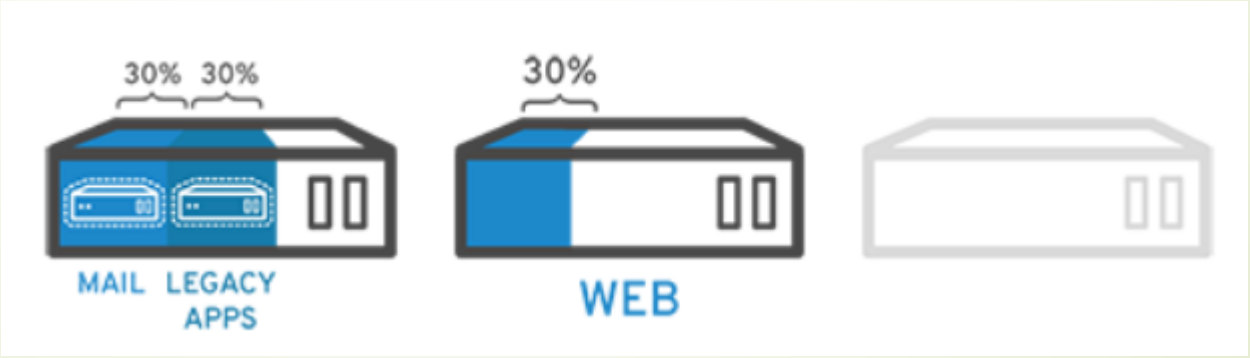
Benefits of virtualization ?

- Reduced expenses

✓ With virtualization tactics, you can take a hard look at your existing infrastructure and identify wasted or idle computing resources.



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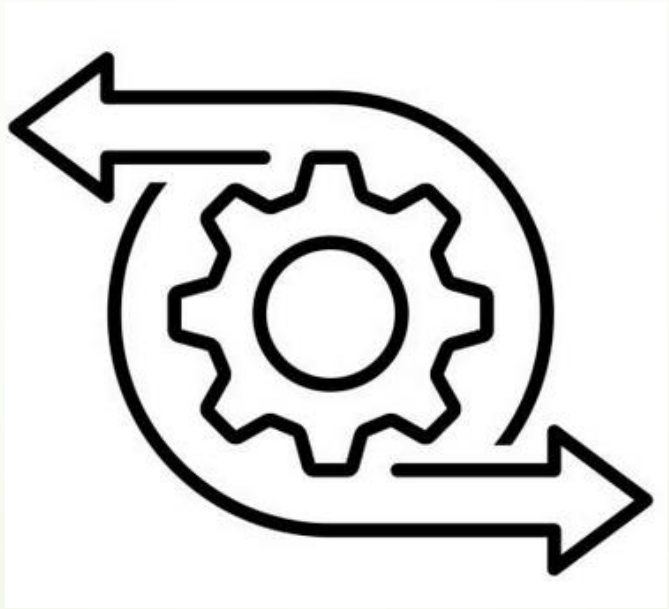
Benefits of virtualization ?

- Resiliency



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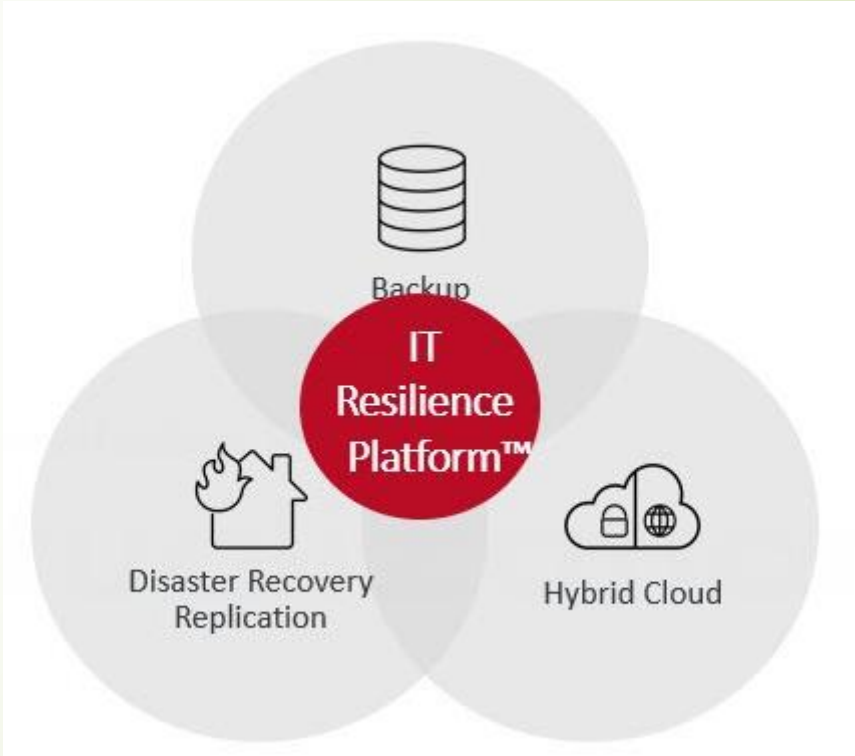
Benefits of virtualization ?

- Resiliency – IT Approach

✓ IT resilience is this ability of an organization to maintain acceptable service levels when there is a disruption of business operations, critical process, or IT ecosystem.



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Benefits of virtualization ?

- High availability

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Benefits of virtualization ?

- High availability

- ✓ Since you can clone a VM almost effortlessly, you can easily set up redundant virtualized environment.
- ✓ Virtualization provides an extremely reliable system with no single point of failure in hardware or software (Failover).
- ✓ Virtualization provides developers constant access (no downtime).

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Benefits of virtualization ?

- Increased efficiency

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Benefits of virtualization ?

- Increased efficiency

- ✓ Virtual environments are much easier to maintain (than physical).
- ✓ With less hardware to worry about... more time to spend on improving the solution.
- ✓ By nature, virtual environments are inherently scalable.

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Benefits of virtualization ?

- Easy DevOps

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Benefits of virtualization ?

- Easy DevOps

- ✓ You can test features and squash bugs without affecting your live product.
- ✓ Facilitates pipeline usage for development, testing and deployment.
- ✓ Virtualization provides on-demand access to an infinite number of peflectly replicated virtual machines for developers to play with.

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