VIRTUALIZATION FOR CLOUD COMPUTING

UNDER THE GUIDANCE OF
PROF. S.S.DHOTRE

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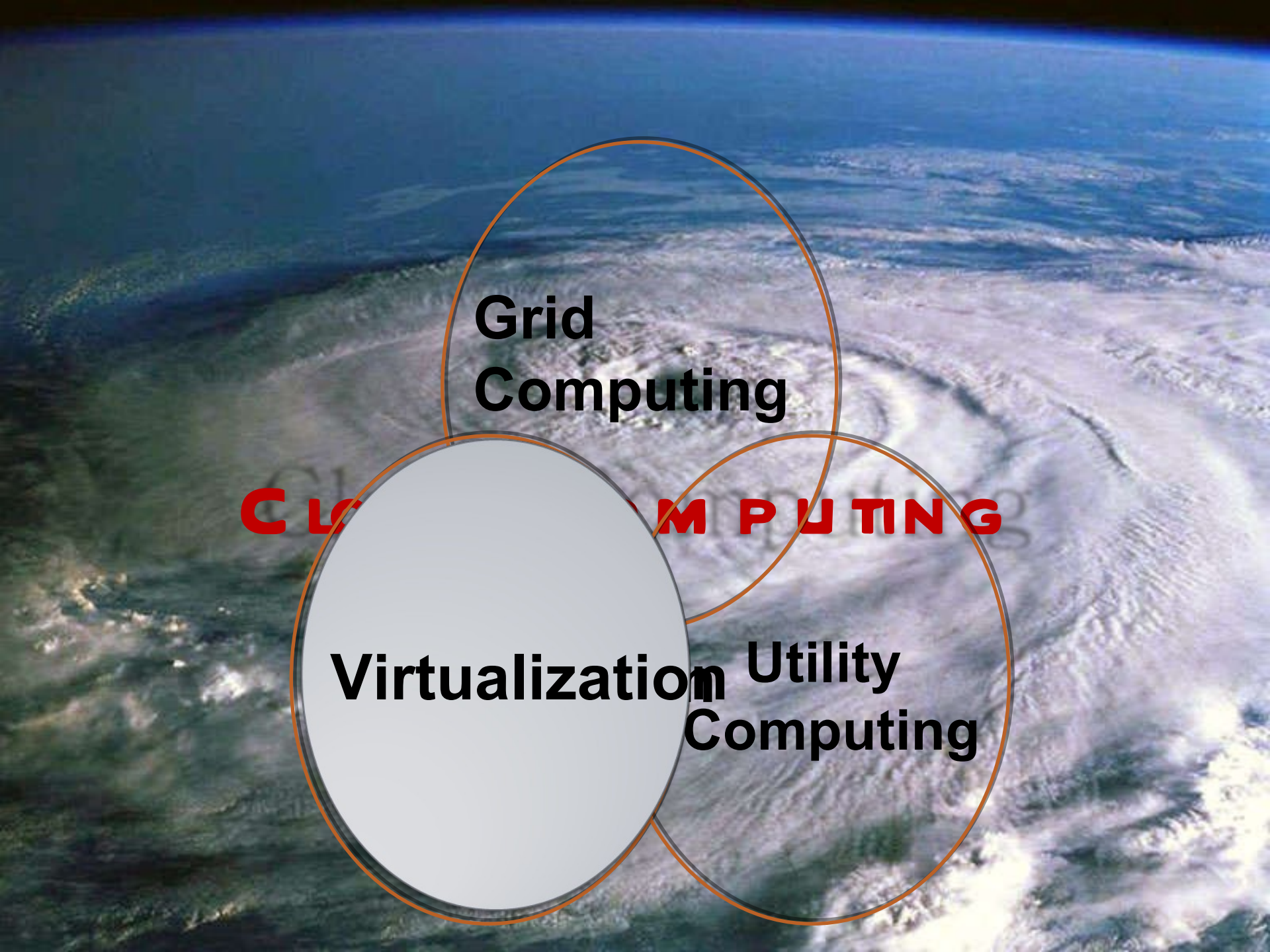

Grid
Computing
Virtualization
Utility
Computing

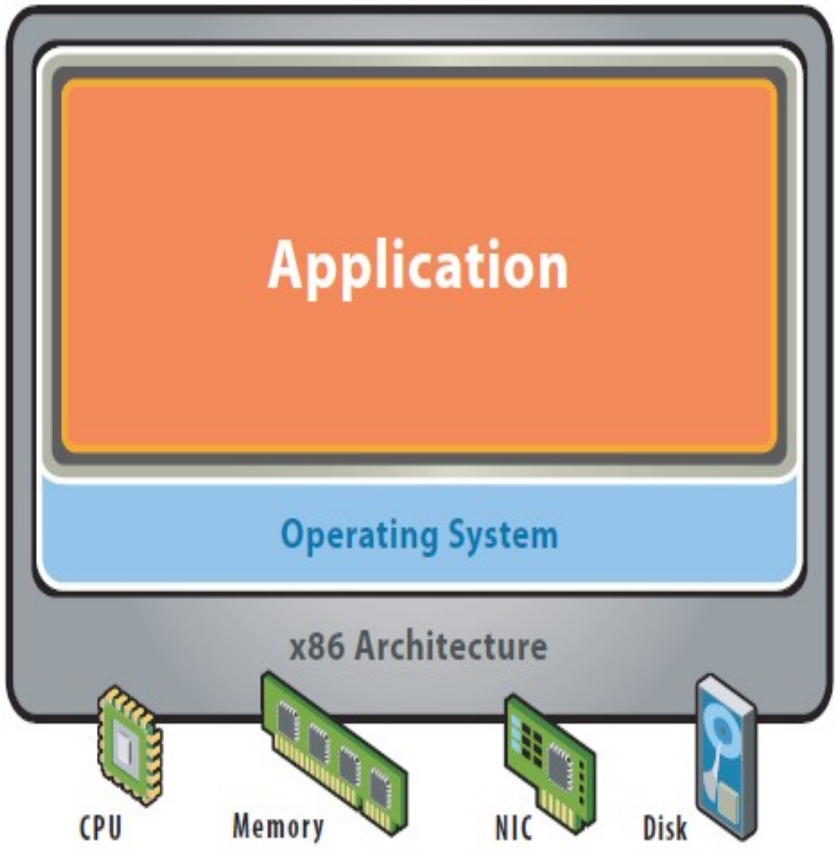
WHAT IS VIRTUALIZATION

- Virtualization is one of the hardware reducing, cost saving and energy saving technology that is rapidly transforming the IT landscape and fundamentally changing the way that people compute.

- With VMware virtualization solutions you can reduce IT costs while increasing the efficiency, utilization and flexibility of their existing computer hardware.

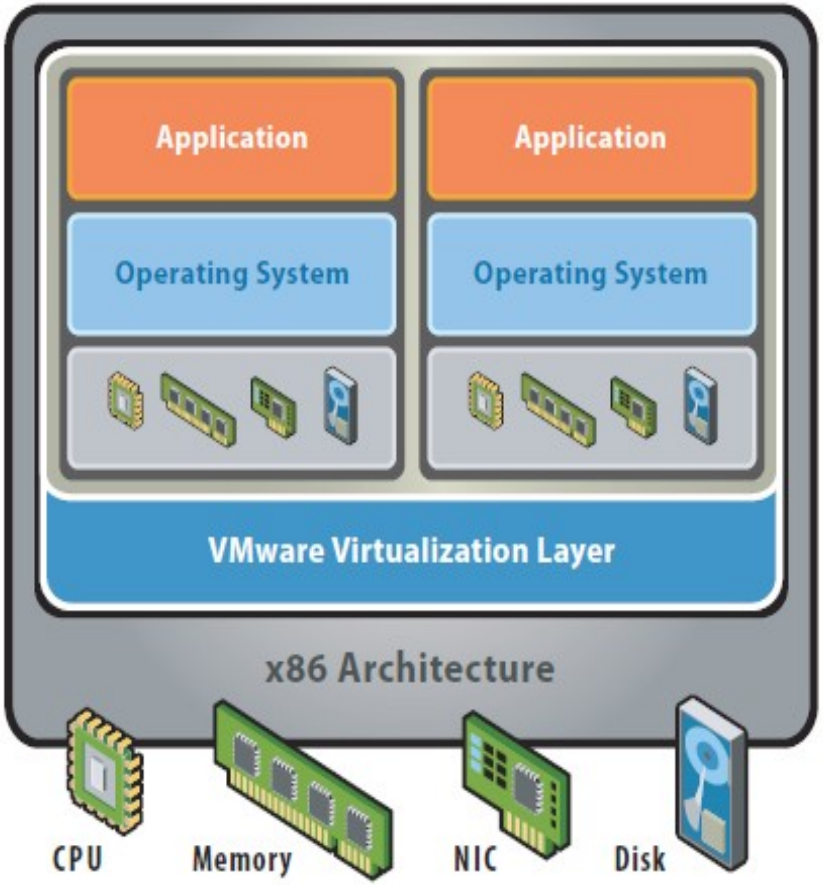
- With Virtualization it is possible to run multiple operating systems and multiple applications on the same SERVER at the same time, increasing the utilization and flexibility of hardware.

Before Virtualization



- Single OS image per machine
- Software and hardware tightly coupled
- Running multiple applications on same machine often creates conflict
- Inflexible and costly infrastructure

AFTER VIRTUALIZATION



- Hardware-independence of operating system and applications
- Virtual machines can be provisioned to any system
- Can manage OS and application as a single unit by encapsulating them into virtual Machines

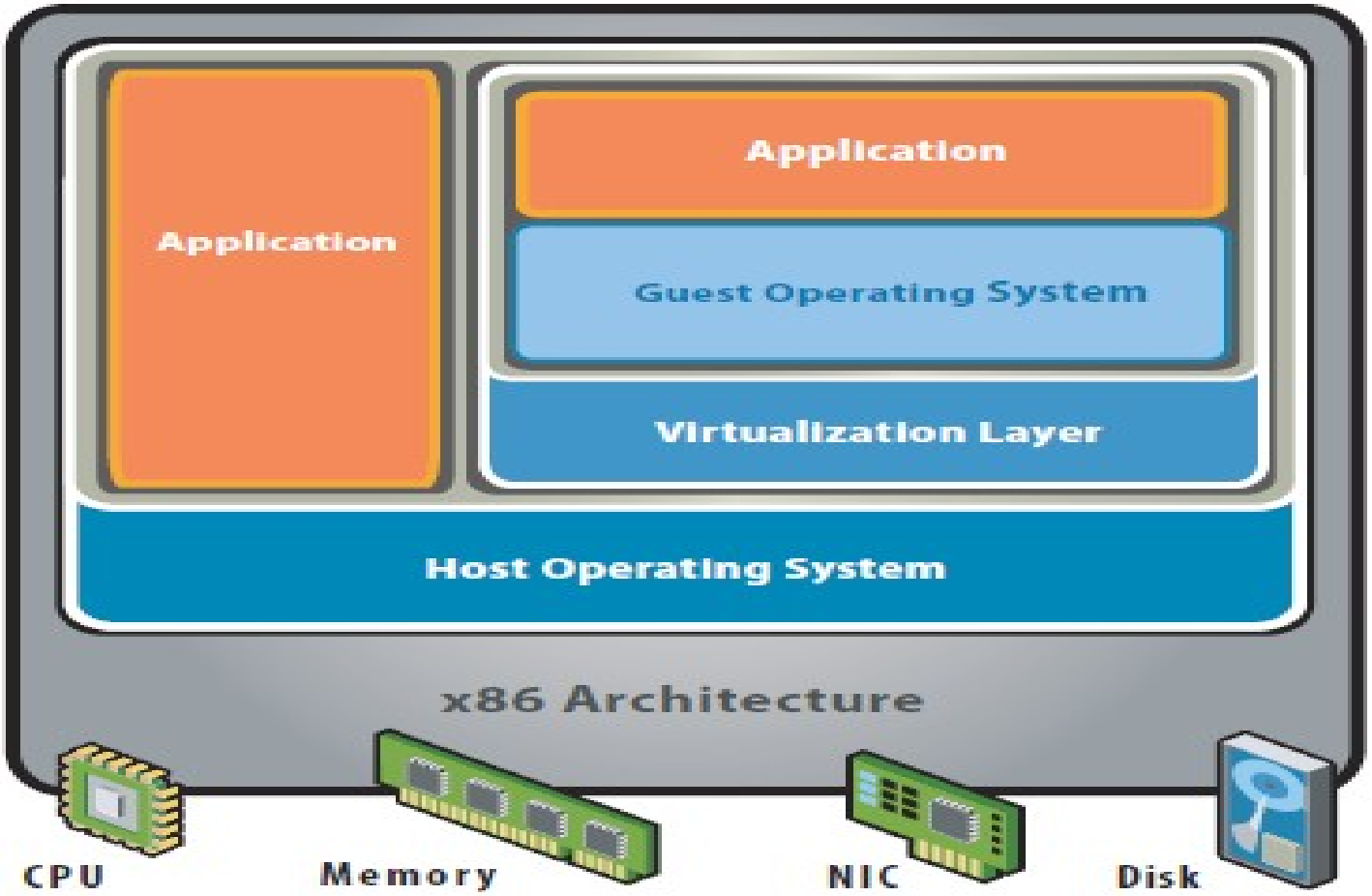
Good Bye~~

Hello ^^

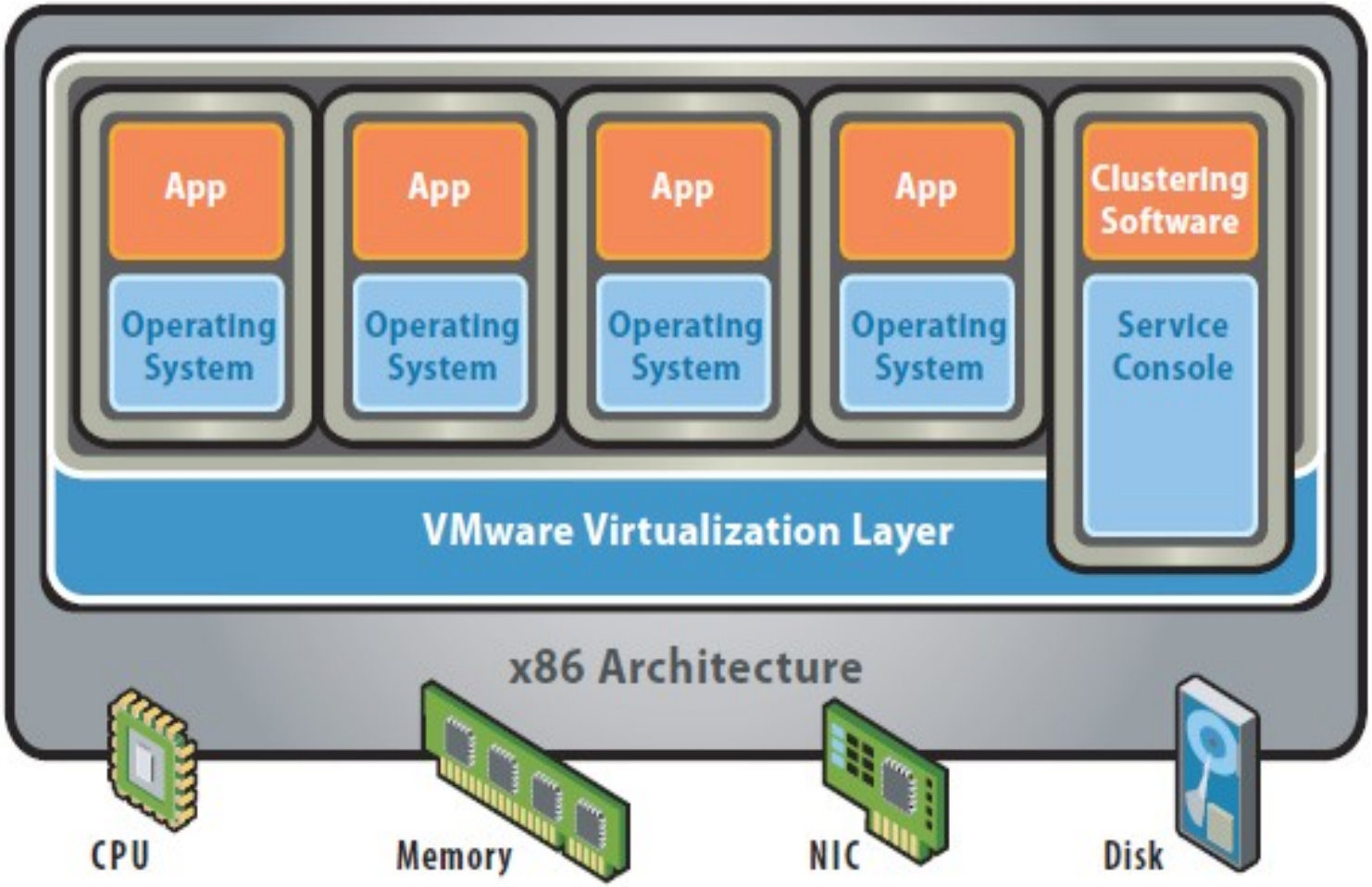
- ✓ Software Developing
- ✓ Application Monitoring
- ✓ Server Management
- ✓ Network Management
- ✓ Security Management
- ✓ Data Management
- ✓ Too many CO^2

- ✓ Software as a Service
- ✓ Platform as a Service
- ✓ **Infra** as a Service
- ✓ **Data** as a Service
- ✓ **IT as a Service**
- ✓ **Green IT**

HOSTED ARCHITECTURE

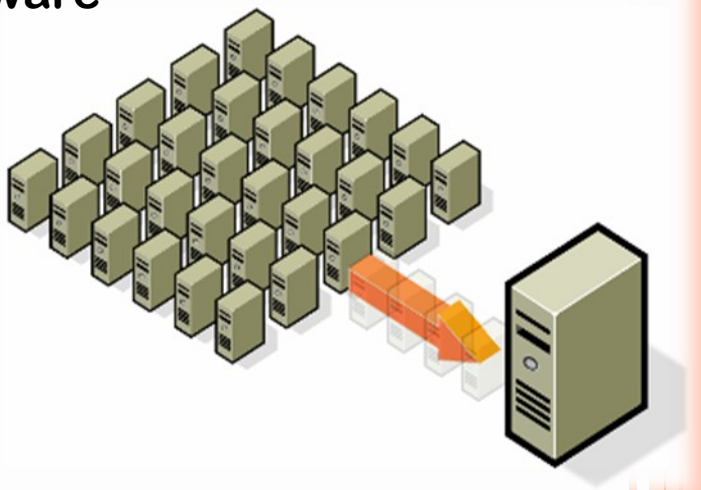


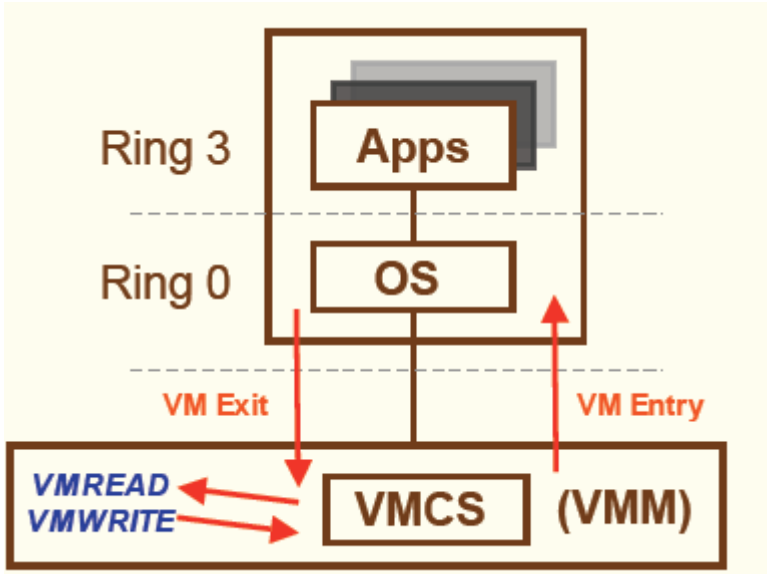
BARE-METAL (HYPERVISOR) ARCHITECTURE



A VIRTUAL INFRASTRUCTURE OFFERS THE SYSTEMATIC ABILITY TO CONTROL A COMPLEX SYSTEM CONSISTING OF SEVERAL X86-BASED SERVERS INTO SEVERAL DIFFERENT EXECUTION ENVIROMENT

- Consolidation
  - Operate different OS and applications on one single server
  - Support existing applications on a new hardware
  - Replace the old hardware in the data center
- Utilize your Existing Servers
  - Realize instantly new projects with virtual infrastructure
  - Postpone new physical hardware purchase





The VM Control Structure (VMCS)

VM-execution controls	Determines what operations cause VM exits	CR0, CR3, CR4, Exceptions, IO Ports, Interrupts, Pin Events, etc.
Guest -state area	Saved on VM exits Reloaded on VM entry	EIP, ESP, EFLAGS, IDTR, Segment Regs, Exit info, etc.
Host -state are a	Loaded on VM exits	CR3, EIP set to monitor entry point, EFLAGS hardcoded, etc.
VM-exit controls	Determines which state to save, load, how to transition	Example: MSR save -load list
VM-entry controls	Determines which state to load, how to transition	Incl uding injecting events (interrupts, exceptions) on entry

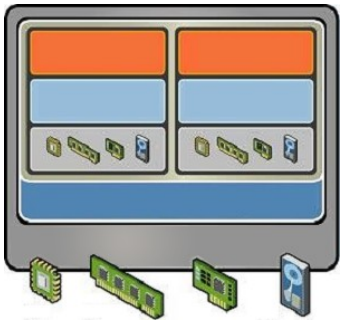
REDUCE ENERGY COSTS AND GO GREEN WITH VMWARE VIRTUALIZATION

Reduce the energy demands of your datacenter by dynamic management of computer capacity across a pool of servers.

VMware infrastructure delivers the resources your infrastructure needs and enables you to:

-Reduce energy costs by 80%.
-Power down servers without affecting applications or users.
-Green your datacenter while decreasing costs and improving service levels.

KEY FEATURES OF THE VMWARE SERVER VIRTUALIZATION



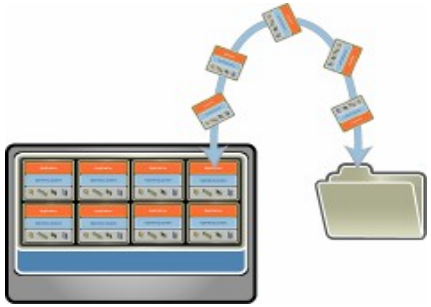
.Partitioning

.Different OS can run on one physical machine

.System resources can be divided between virtual machines

•Isolation

- Fault and security isolation on a hardware level
- Extended resource control for constant performance



•Encapsulation

- Complete status of a virtual machine can be stored in a file
- Move and copy of a virtual machine is as easy as it is with files

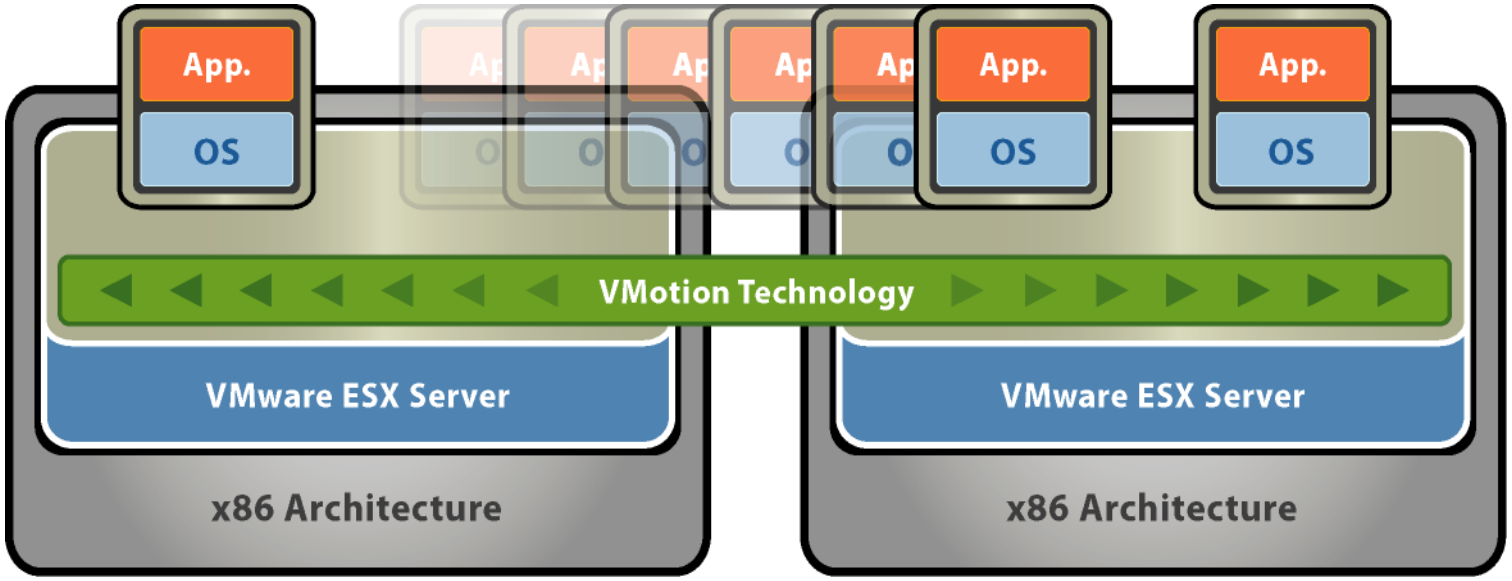
SERVERS CONSOLIDATION

110 Servers without VMware software

12 Servers, 1 rack with VMware software

VMWARE VMOTION

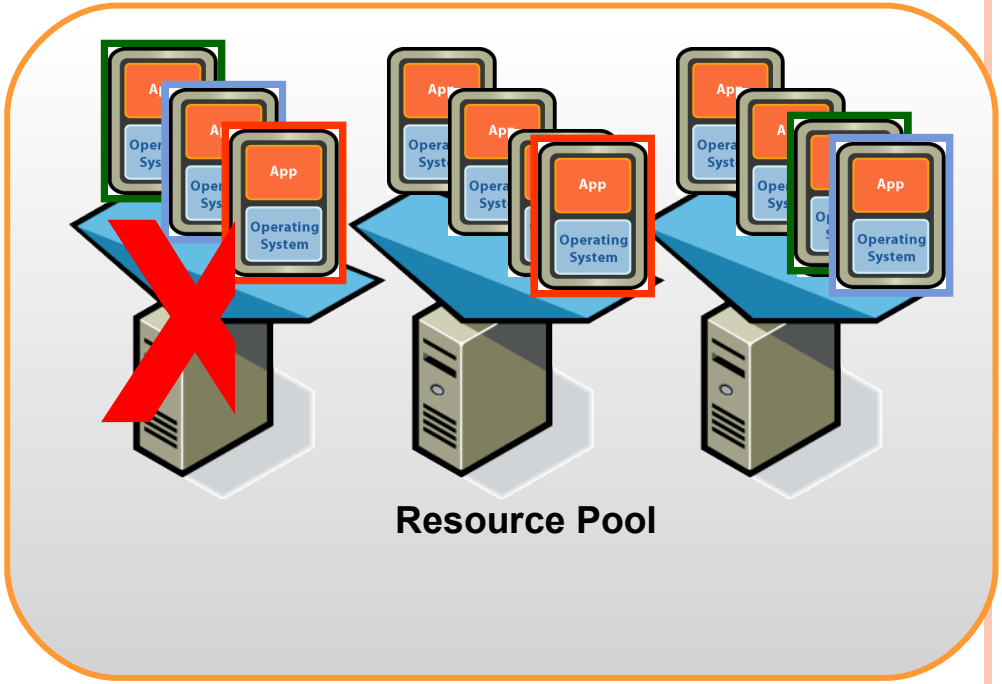
- The VMotion technology allows the live migration of virtual machines from one physical server to another and needs therefore no downtime for maintenance activities.
- Move running applications to other servers without disruption. Zero downtime for hardware maintenance.
- Automates moving virtual machines to other hosts and automates re-balancing
after maintenance complete



UNPLANNED DOWNTIME: SERVER FAILURE - VMWARE HA

Simple, Cost effective high availability for all servers

- Automatic restart of virtual machines in case of server failure
- No need for dedicated stand-by hardware
- None of the cost and complexity of clustering



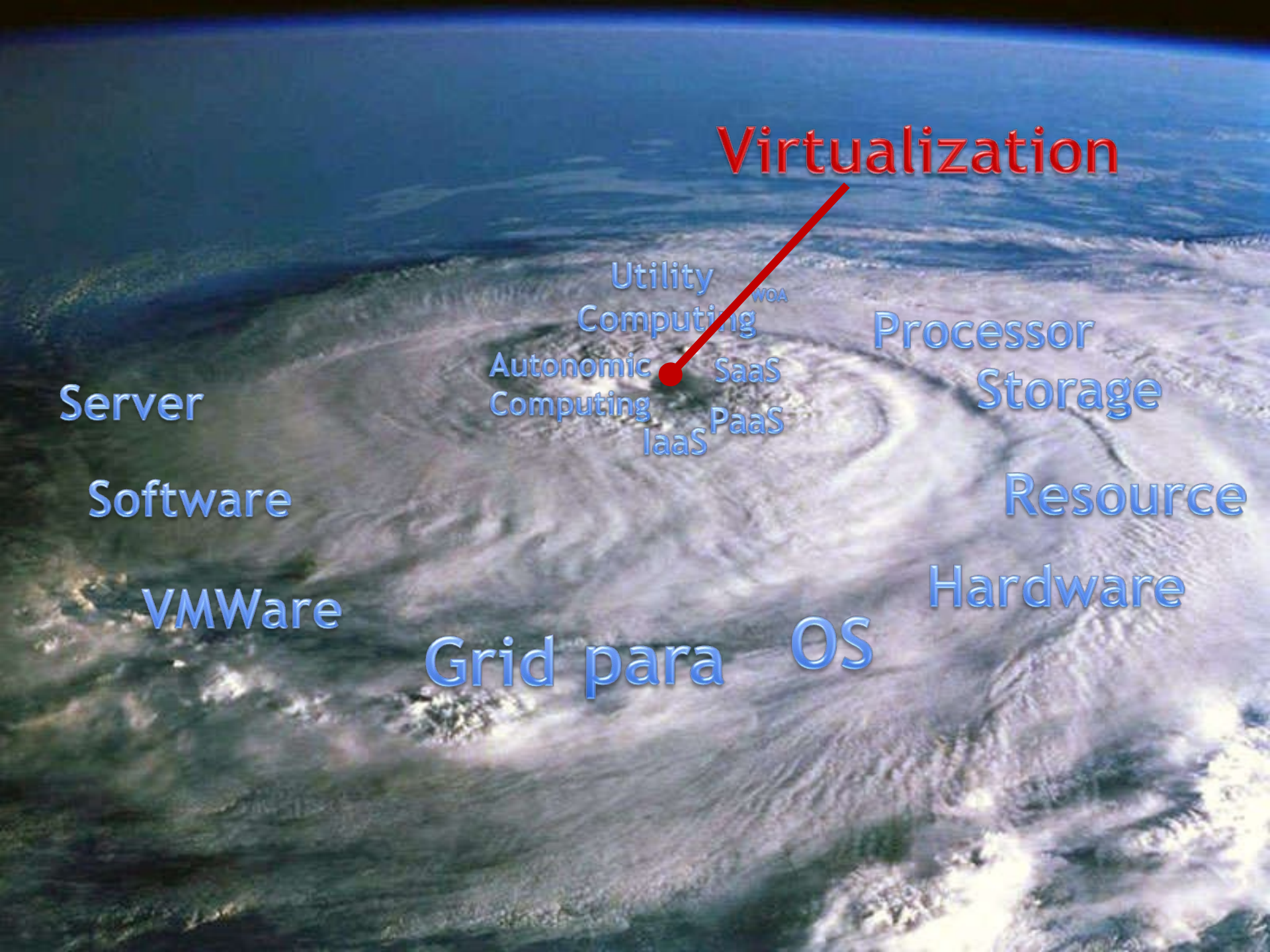
Virtual DeskTop Infrastructure

Virtualized & isolated end-point components

Centralized single instance images

Apps

Desktop OS


Virtualization
Utility
Computing
WOA
Autonomic
Computing
SaaS
PaaS
IaaS
Server
Software
VMWare
Grid para
OS
Processor
Storage
Resource
Hardware

MANAGING YOUR VIRTUAL CLOUD

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BENEFITS OF VMWARE VIRTUALIZATION

- Easier Manageability
- File, Server, OS, Data manage
- Fault Isolation
- Efficient use of Resources
- Portability
- Problem-Free Testing
- Reduced Costs
- The Ability to Separate Applications
- Easier Manageability

CONCLUSION

- One of the main cost-saving, hardware-reducing, and energy-saving techniques used by cloud providers is virtualization
- With OS virtualization each VM can use a different operating system (OS), and each OS is isolated from the others.
- Use VMs to enabling different services to run in separate VMs on the same physical machine._

THANK YOU