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Cloud Computing and IoT

Part -IV
Cloud Computing and Virtualizatio

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Outline

Introduction - Virtualization

- Virtualization is a fundamental technological innovation that allows skilled IT managers to deploy creative solutions to business challenges.
- Common business challenges in dynamic business world:
  - Cost-effective utilization of IT infrastructure
  - Responsiveness in supporting new business initiatives
  - Flexibility in adapting to organizational changes
- Virtualization is efficient use of existing resources that delivers huge cost savings in measurable performance
- A key benefit of virtualization is the ability to run multiple operating systems on a single physical system and share the underlying hardware resources
- Virtualization is the separation of a resource or request for a service from the underlying physical delivery of that service.
- Example: With virtual memory computer software gains access to more memory than is physically installed

Introduction - Virtualization

- Virtualization can be applied to IT infrastructure layers
  - Networks , Storage, Laptop, Server Hardware, Operating Systems and Applications
- Virtualization offers organizations:
  - New models of application deployment to meet user expectations
  - Modular packages to provide new services, and
  - Advanced features that bring automatic load balancing, scalability without downtime, self-healing, self-service provisioning
- Generally, Virtualization provides
  - A layer of abstraction between computing, storage and networking hardware, and the applications running on it
  - Abstraction of physical computing resources into a logical object
  - Administrators the advantage of managing pooled resources across the enterprise
  - IT managers to be more responsive to dynamic organizational needs and to better leverage infrastructure investments

Virtualization Techniques

- Virtualization techniques are used to create and manage virtual environments
- They creates virtual versions of physical resources, such as servers, storage devices, networks, and even entire operating systems.
- **Before Virtualization:**
  - *Single OS Image per Machine:* Each physical machine runs only one operating system.
  - *Tightly Coupled Software and Hardware:* Software is directly tied to the hardware, limiting flexibility.
  - *Application Conflicts:* Running multiple applications on the same machine often leads to conflicts.
  - *Underutilized Resources:* Hardware resources are often underutilized, leading to inefficiencies.
  - *Inflexible & Costly Infrastructure:* Scaling and managing infrastructure is inflexible and expensive.

Virtualization Techniques

- **After Virtualization:**
  - *Hardware Independence:* Run operating systems and applications on different hardware platforms. Increased flexibility for deployment and management.
  - *Portability:* Easily move virtual machines between physical servers. Simplified migration and disaster recovery processes.
  - *Resource Consolidation:* Efficiently utilize server resources. Reduce hardware costs and energy consumption.
  - *Simplified Management:* Manage operating systems and applications as self-contained units. Streamlined provisioning and maintenance.

Benefits of Cloud Computing

- Compared

Uses of Cloud Computing

- If

Cloud Computing for Organization

- Cloud

Cloud Computing Use Cases

- Cloud

Cloud Computing Deployment Models

- Not

Cloud computing service Models

- Choosing