Virtualization

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What is it?

A way to run multiple systems on a single computer

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Vocabulary

- Virtual Machine - A single virtual system
- Host - The physical system
- Guest - The virtual machine

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Current Challenges

- Application per server ratio
  - Too high?
  - Too low?
- Time spent on basic tasks
- Difficulty in migration to new hardware
- Cost of maintaining infrastructure

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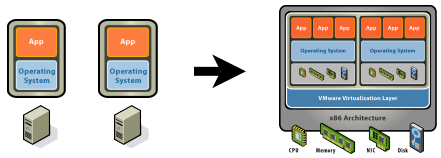
Before Virtualization

After Virtualization



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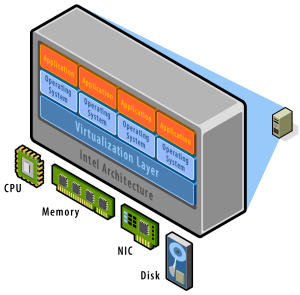
After Virtualization



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Characteristics

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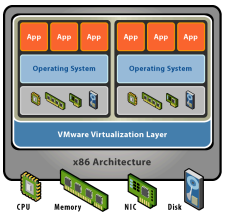
Partitioning



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Isolation

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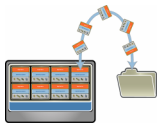
Encapsulation



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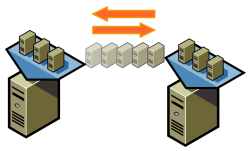
Migration



Hot, Cold, and Manual

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Virtualization Timeline

- 1960: IBM S/360 Model 67 mainframe
- 1999: VMware Virtual Platform
- Now: Mainstream Virtualization

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Virtualization for Workstations

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Software & OS Testing

- Test & demo multiple OSs
- Software packaging
- Patches before rollout
- Group policies
- Test software on different patch levels
- Image deployment testing

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Virtualization for Servers

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Why?

- In a perfect world...
- Unreliable operating systems
- Incompatible software combinations
- Utilization of resources
- Virtualization is a necessary tool in reality

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Benefits

Consolidation

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Consolidation: Problem

- Too many servers
- One server running too many applications

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Consolidation: Solution

- Physical to virtual migrations
- Migrating applications to separate virtual machines if possible

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Machine Migration

- Products:
  - VMware Converter (Previously P2V)
  - Platespin Powerconvert
- Uses:
  - Physical to Virtual
  - Virtual to Virtual

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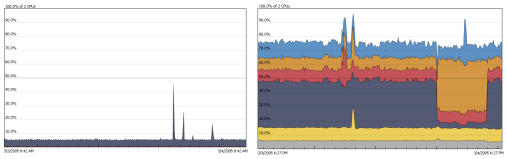
Before Virtualization

After Virtualization



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Consolidation: Benefits

- Improves server utilization
- Balances load across multiple servers
- Reducing total number of servers
  - Lower power usage
  - Lower cooling costs

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Benefits

Provisioning

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Provisioning: Problem

- New software = new server
- New servers take time to provision

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Provisioning: Solution

- Deploy new servers as virtual machine
- Use virtual machine templates

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Provisioning: Benefits

- No added power, cooling, or network requirements
- No hardware to rack and install
- Provision new servers previously cost or resource prohibitive
- Virtual machines can be migrated to new servers easily and with little downtime

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Provisioning: Virtual Appliances

- Preconfigured application environments
- Includes OS and application
- Vendor tweaked installations
- VMware Virtual Appliance Marketplace
- Microsoft TechNet

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Benefits

High Availability

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High Availability

Problem: Downtime = Unhappy Users

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High Availability

Solutions

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VMware Vmotion

Allows migration of running virtual machine

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VMware HA

In case of failure, VMs are automatically restarted

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VMware DRS

Automatic load balancing of VMs

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Backups

VMware Consolidated Backup & Vizioncore ESXRanger

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Virtualization for Desktops

Virtual Desktop Infrastructure

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Virtualization Pitfalls

- Too many virtual machines
- Dependance on fewer servers
- Training and qualified help
- Software vendor support
- Trying to virtualize everything
- Server OS licensing

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Our Project

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Goal

- Higher availability for servers
- More storage & expandability
- Decommission troublesome file server
- Be ready for new web servers
- Disaster recovery readiness
- Testing of software

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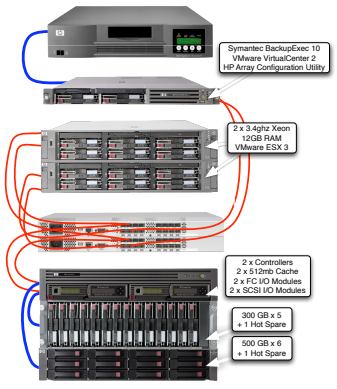

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How did it go?

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Next steps?

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Questions?

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