



# IBM Information Infrastructure: *Virtualising the Data Centre*



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# The New Enterprise Data Center

*An evolutionary new model for efficient IT service delivery*



## *Initiatives*

*Consolidation and Virtualization*

*Energy Efficiency*

*Business Resilience and Security*

*Service Management*

*Information Infrastructure*

# Definition

The screenshot shows the Wikipedia page for 'Virtualization'. A large blue callout box is overlaid on the page, containing the text: **Abstracting the "thing-ness" from a thing**. The background page shows the article's title, a navigation menu on the left, and a list of sub-topics including Platform virtualization, Resource virtualization, and Application virtualization. A disambiguation notice at the bottom states: 'This disambiguation page lists articles associated with the same title. If an internal link led you here, you may wish to change the link to point directly to the intended article.'

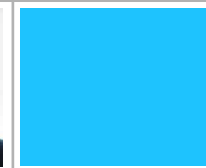
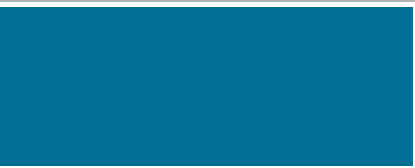
## How could virtualisation help your client lower costs?

### *Immediate savings potential for:*

- **Reduce the number of devices in the data center**
- **Improve utilization of existing resources**
- **Save on data storage costs**
- **Reduce the number of software licenses to monitor and pay**
- **Allow recapture floor space for more profitable use**
- **Increase your power and cooling efficiencies**
- **Cut administrative expenses**

### *Longer-term value possibilities:*

- **Improve employee productivity**
- **Cut costly downtime**
- **Helps protect against high-cost security failures**
- **Support freedom of choice in selecting future technologies that have the best cost-to-performance ratios**
- **Enable greater flexibility to leverage new technologies more quickly**



# IBM Systems Agenda

## Openness – Exercise choice!

IBM provides the industry's richest portfolio of interoperable server and storage systems



## Collaborative Innovation –

### Transform your business!

IBM provides the breadth of expertise and resources to design, build and implement IT solutions that can help you drive innovation



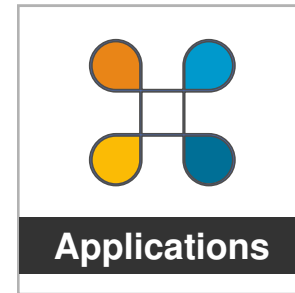
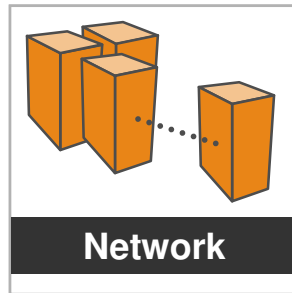
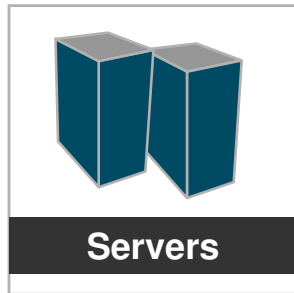
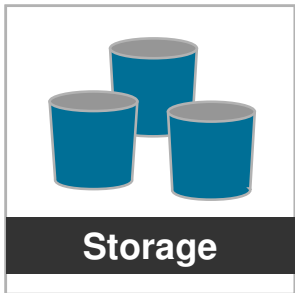
## Virtualization –

### Optimize IT operations!

Dynamically respond to the priorities of the business by managing the IT environment more efficiently



# What can you virtualise?



**freedom of choice**

# IBM Virtualisation

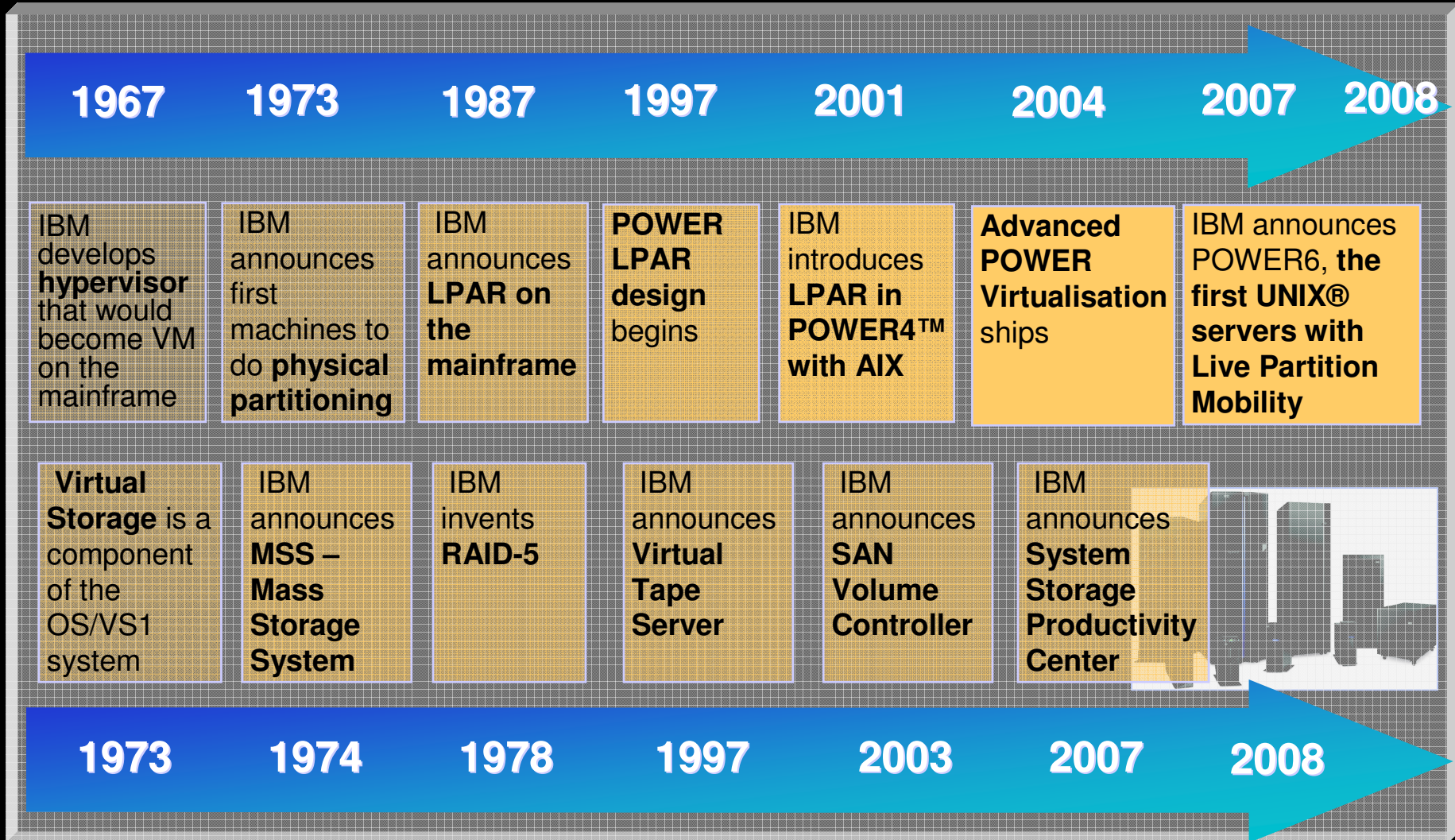
## Key Principles

- Comprehensive
- Open
- Heterogeneous
- Common skills





# IBM's 40 years of Leadership in Virtualisation





# Virtualisation leadership



- **100 percent** of IBM mainframes are delivered virtualisation ready
- **82 percent** of IBM System i5 595 servers are ordered with logical partitioning
- **Over 40,000** UNIX, mainframe and System i companies exploit systems-level virtualisation
- IBM System x clients deploy over **1,000 virtual servers** a day
- **IBM is the leading reseller** of VMware
- **3,000 storage virtualisation clients**, adding more than five every day
- More than **3,400 virtual tape systems** supporting one exabyte of data
- ServerWatch awarded **IBM Virtualisation Manager Best Virtualisation Tool** in their annual Product Excellence Awards for 2007
- IBM System x3950 won **Best of Show** at the 2007 WMworld event
- **Hundreds** of in-depth total cost of ownership studies

# Systems Resource Virtualisation Offerings

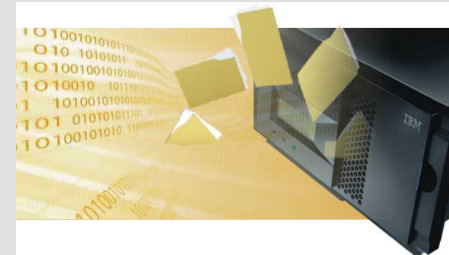
## Server virtualisation

- System z LPARs & workload management
- POWER Systems
  - PowerVM (Formally Advanced POWER Virtualisation)
  - Live partition mobility, live application mobility, workload partitions
- Modular Systems
  - BladeCenter
  - VMware, Xen virtual machines
- Virtually consolidate workloads on servers



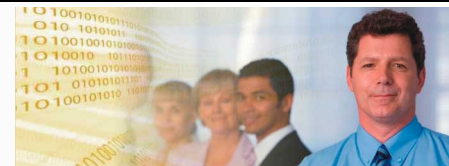
## Storage & File virtualisation

- File virtualisation
  - IBM General Parallel File System
  - Virtually consolidate files in one namespace
- File system virtualisation
  - IBM System Storage N series Virtual File Manager
  - Virtually consolidate file systems into one namespace
- Block storage virtualisation
  - IBM System Storage SAN Volume Controller

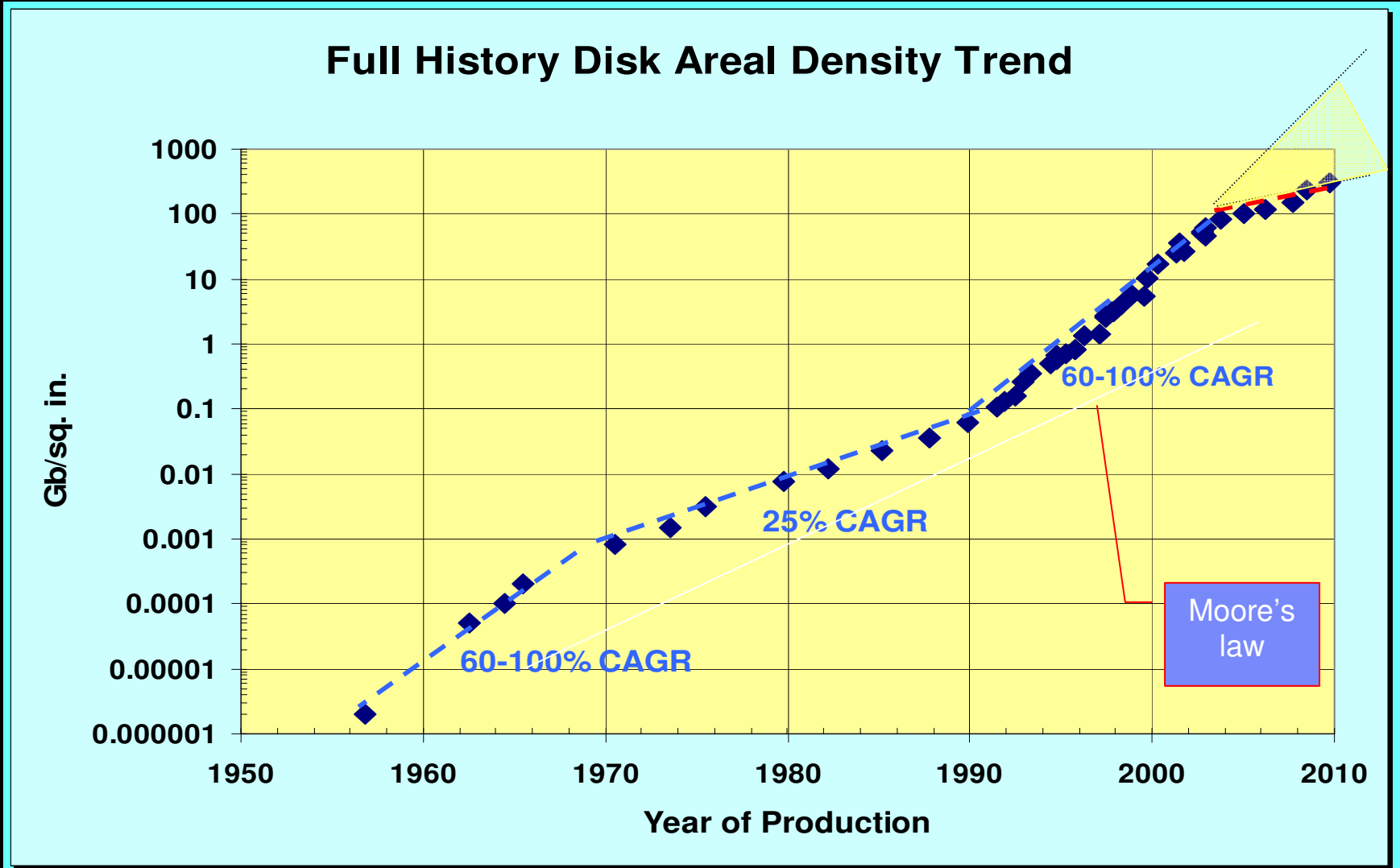


## Complementary benefits of virtualisation throughout IT infrastructure

- Consolidation, better management efficiency, improved flexibility & responsiveness, reduced cost, nondisruptive changes



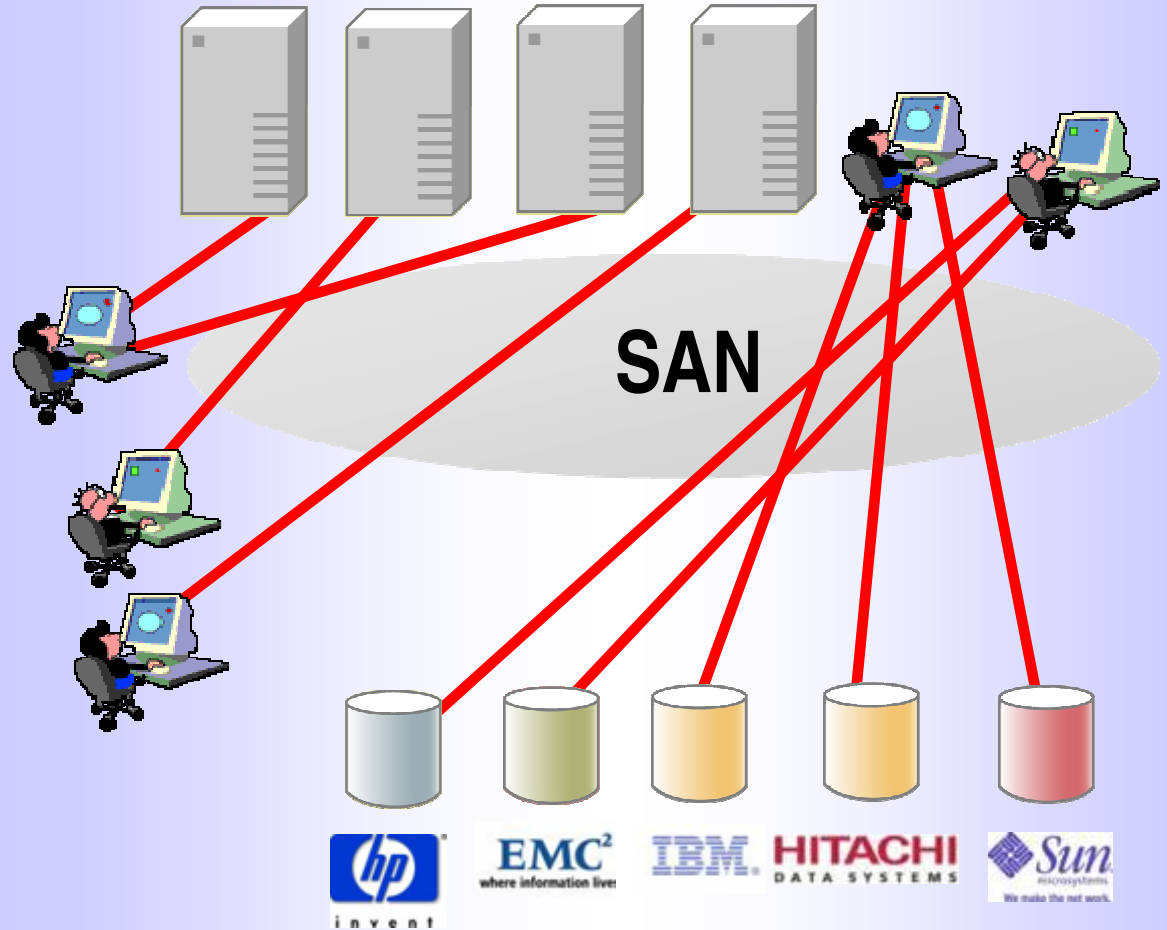
# “Ye canna change the laws of physics Cap’n”



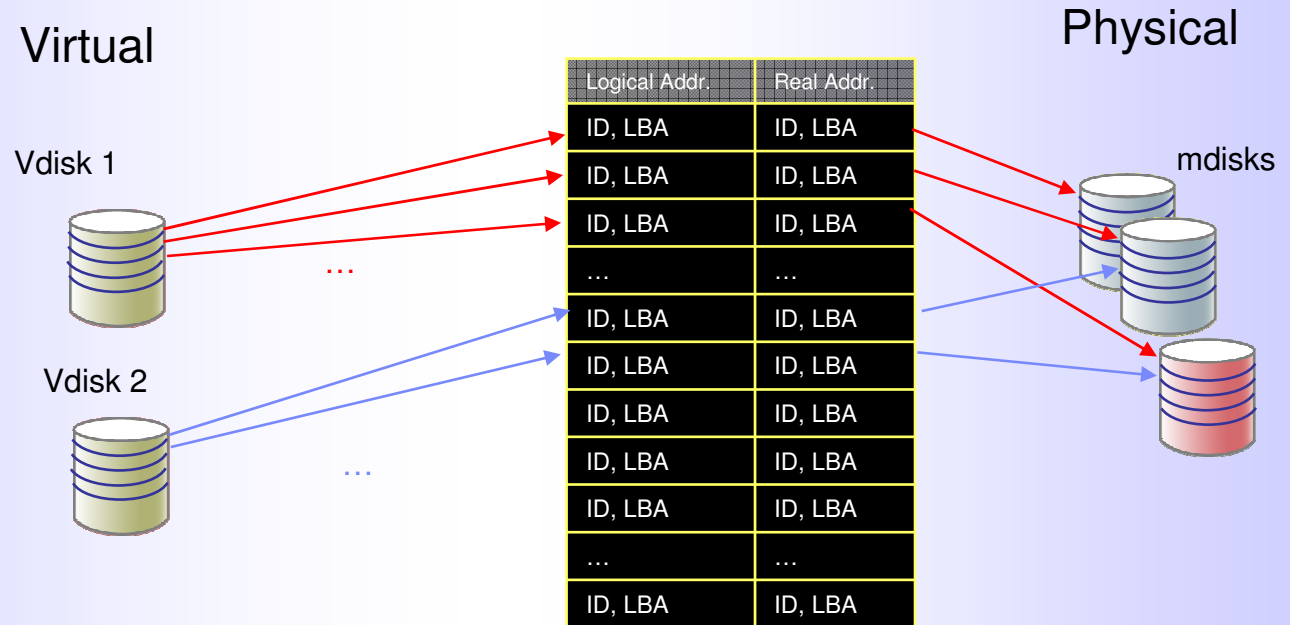
# Today's Storage management

In a typical IT environment, infrastructure management is

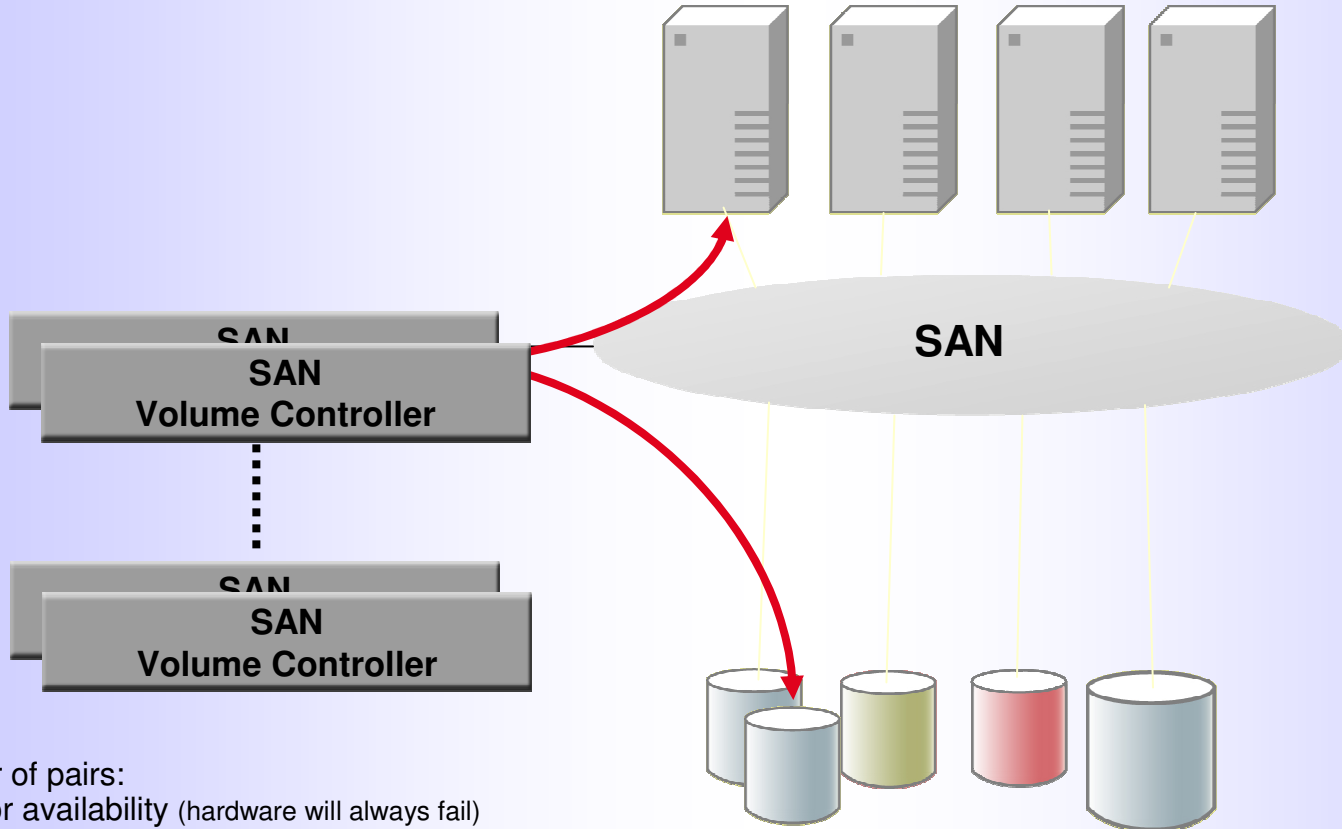
- Complex
- Inefficient
- Insufficient



# What is SVC doing?



# SAN Volume Controller - Physical

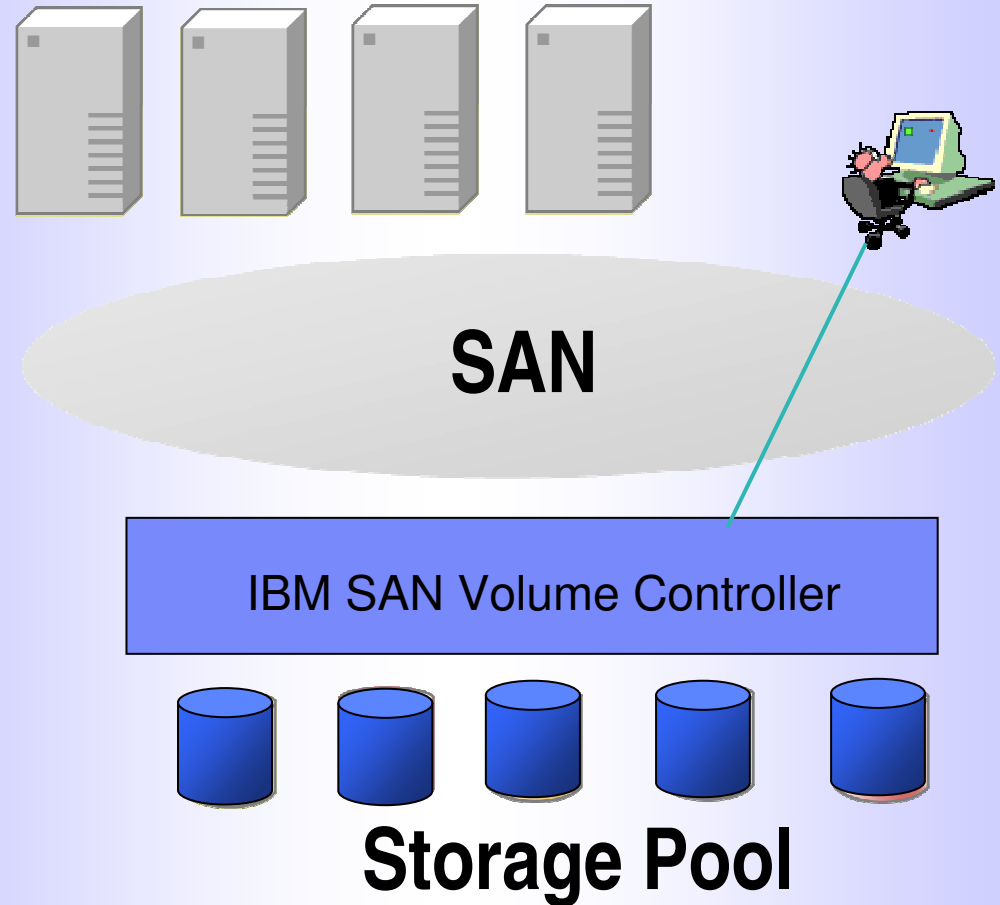


Cluster of pairs:  
 Pair for availability (hardware will always fail)  
 Cluster for scalability (one design for whole range of sizes)

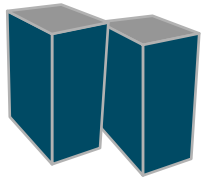
# Virtualisation = Openness

## Virtualization Enables:

- Vendor Choice
- Tiered Storage
- Migration
- Application Uptime





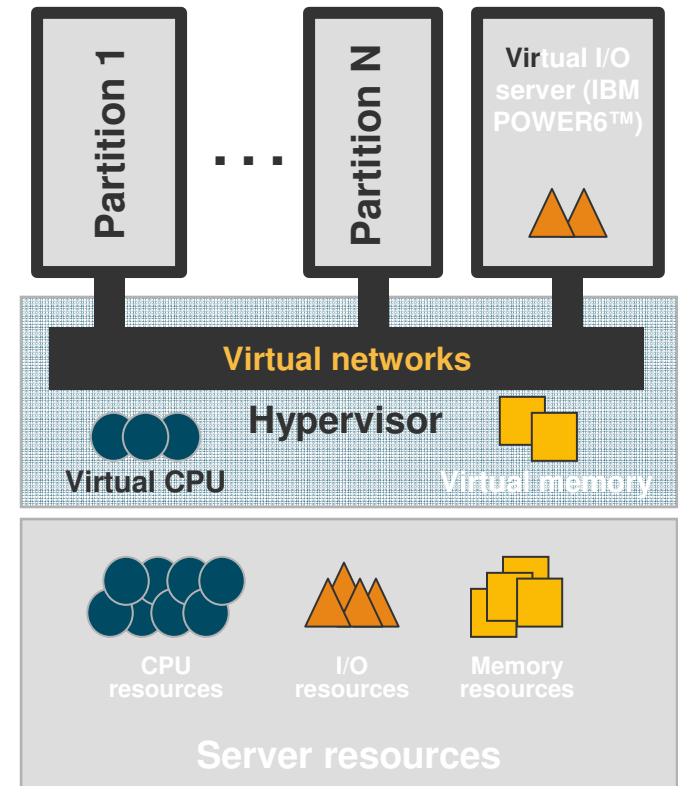


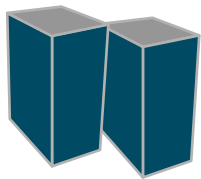
Servers

# Virtualisation of Server

*Optimize resources within a single server*

- **Hypervisor technology offers:**
  - High resource utilization
  - Flexibility and responsiveness
  - Workload quality of service
- **State of the art virtualisation with hypervisors**
  - IBM System z and IBM z/VM<sup>®</sup> technology
    - Gold standard for virtualisation
    - IBM System p and IBM System i hardware
  - Unique capabilities including micro-partitioning, and dynamic partitions
    - Network virtualisation, virtual input and output, multiple operating systems in a single server

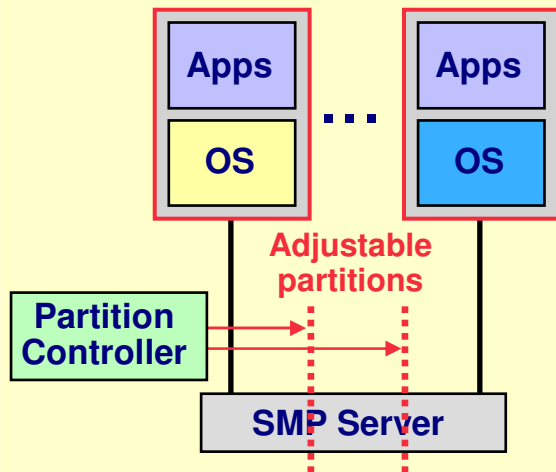




Servers

# Virtualisation of Server

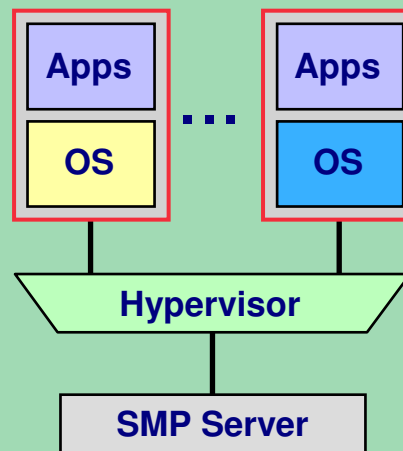
## Hardware Partitioning



Physical partitioning  
Sun Domains, HP nPartitions

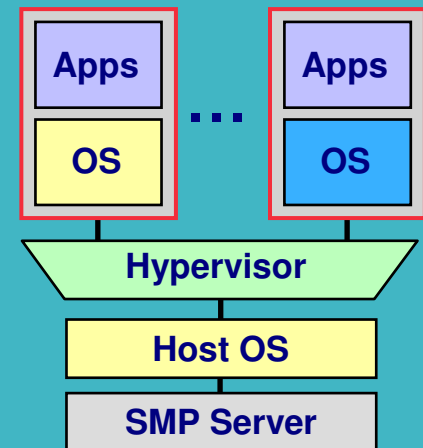
Logical partitioning  
pSeries LPAR, HP vPartitions

## Hypervisor: Type 1

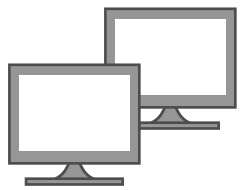


Hypervisor software/firmware runs directly on server.  
zSeries PR/SM and zVM  
POWER Hypervisor  
VMware ESX Server  
Open Source Hypervisor (Xen)  
Virtual Iron, ScaleMP

## Hypervisor: Type 2



Hypervisor software runs on a host operating system.  
VMware GSX  
Microsoft Virtual Server  
Win4Lin  
User Mode Linux



**Workstations**

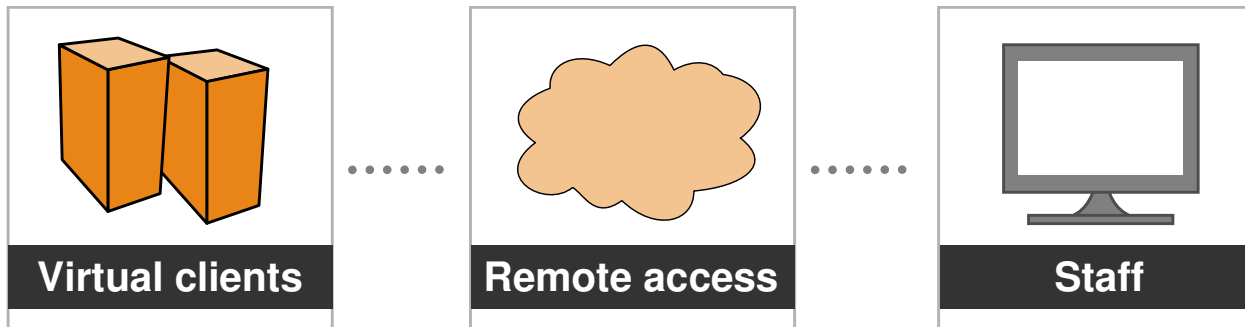
# Virtualisation of Workstation

## *IBM virtual client solution enables:*

- Central management
- Back-end storage of the desktop
- Offline patching of the desktop
- Automated enforcement of security policies

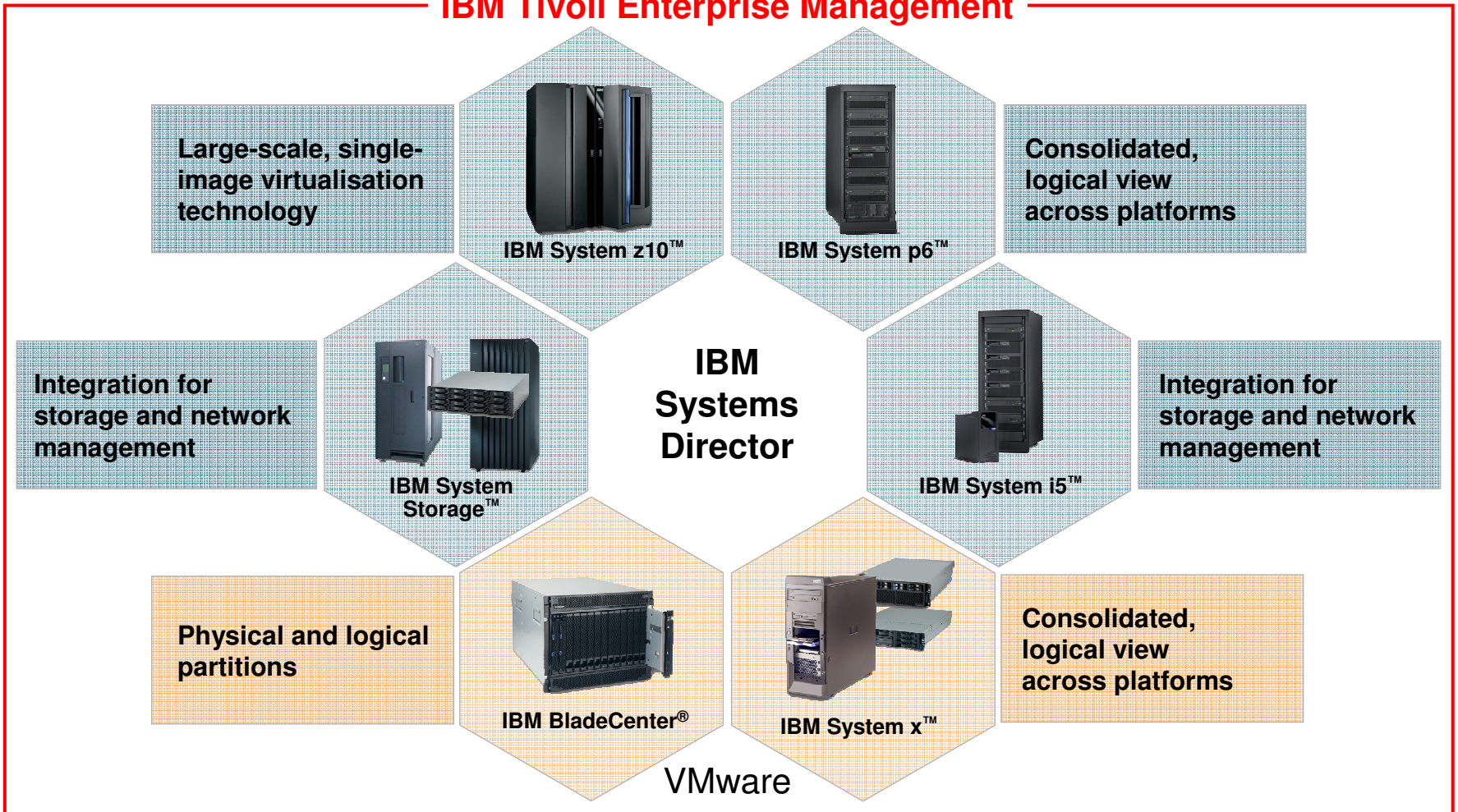
## *Potential Benefits:*

- Lowers support costs by enabling you to centralize management of all desktops
- Enables you to replace thick clients with lower-cost thin client
- Increases security by reducing the number of fat clients



# What do IBM virtualisation technologies provide?

## IBM Tivoli Enterprise Management



# IBM

