



Are we up to...
no one gets fired for virtualising yet?

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...report from the battlefield

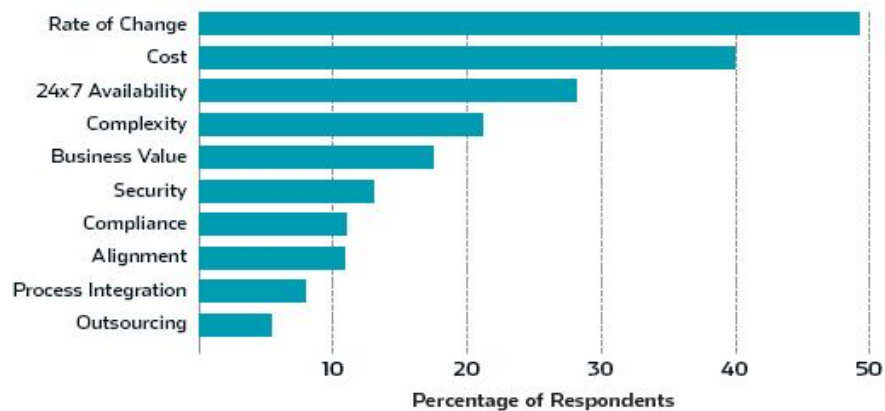
Consider...



1. Biggest Pressures on IT Operation
2. How can Server Virtualisation address these Problems?
3. What is Server Virtualisation
4. Advantages
5. Data Centre and Power Costs
6. Challenges

3

Biggest Pressures in IT Operation and Infrastructure Management



DATA: Gartner survey of 2,000 IT operations leaders, Dec. 2006



Top 6 Priorities:

1. Rate of Change

- Need flexibility in services
- Need flexibility & fast response to changing level of demand

2. Cost

- Always an issue!!
- Proliferation of servers is a huge increasing support cost
- Diverse systems adds to costs

3. 24 X 7 Availability

- Online all the time!!
- Reliability and resilience key
- Disaster Recovery and Backup very important

5



Priorities continued:

4. Complexity

- Proliferation of different Operating Systems and Hardware, plus many varieties of Unix, Linux, Windows
- Although less Mainframe and proprietary systems now, the complexity of systems and dedicated servers has exploded

5. Business Value

- Providing the best service for the organisation
- Reduce costs, increase effectiveness, adapt to needs

6. Security

- Information Security vitally important today
- Security against attack, interference, mis-management, etc
- Government mandatory standards becoming more stringent

How Can Server Virtualisation help

Rate of Change

- Provide flexible services, with dynamic allocation of resources to new or expanding tasks

Cost

- Reduce infrastructure costs

24 x 7 Availability

- Redundancy built in

7

How Can Server Virtualisation help

Complexity

- Merge several diverse systems into a centrally managed infrastructure

Business Value

- Cost effective, flexible and adaptable

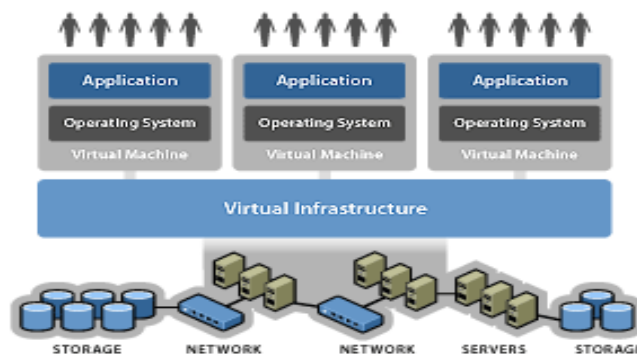
Security

- Reducing systems with improved management of several systems under a single security standard

8

What is Server Virtualisation

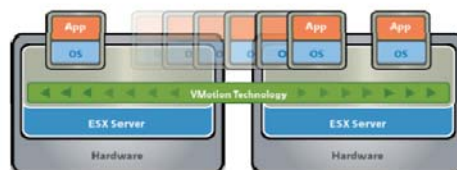
- Replacement of dedicated physical servers with a single server environment, that enables the dynamic mapping of physical resources to virtual servers



9

Advantages: Improved Flexibility

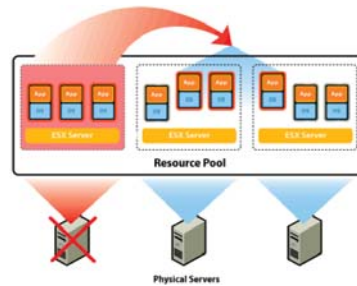
- Load balancing and sizing to suit seasonal demand for IT resources
- Dynamic provisioning of resources whenever needed
- Better utilisation of spare resources, such as development servers in non-development periods
- It is much easier to test new applications, by quickly setting up a new 'Proof of Concept' virtual server



10

Advantages: Improved Resilience

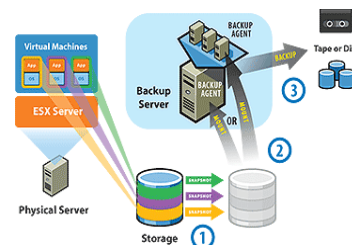
- Redundancy without duplicating servers
- Legacy maintenance is a large cause of server downtime
- Virtualisation can enable Disaster Recovery capability at a more affordable cost
- Improve Business Continuity - virtualisation allows different solutions to guarantee 100% service and Disaster Recovery uptime – live migration if there is a single server failure, SAN storage redundancy, multiple network and power controllers



11

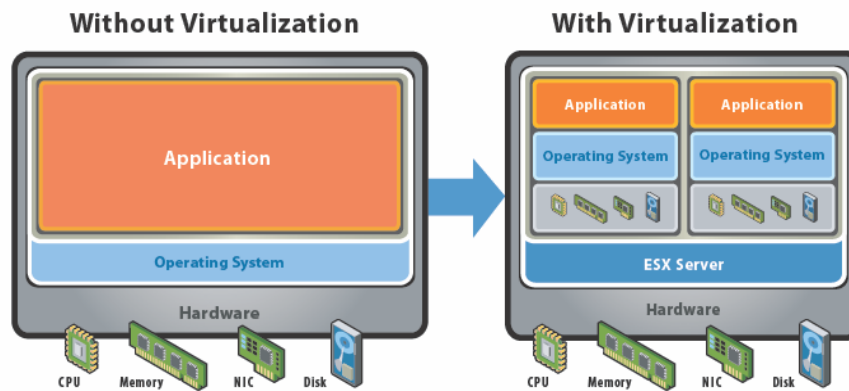
Advantages: Reduced Complexity and Costs

- Typical server utilisation is only 8-15%. Increasing utilisation to 45% can reduce the number of servers deployed and associated costs by 2/3rds!
- Many systems are scaled to handle peak load, with resultant waste of resources in non-peak times
- Implementing Server Virtualisation delays IT spending on new servers
- Provide consolidated backup for Disaster Recovery

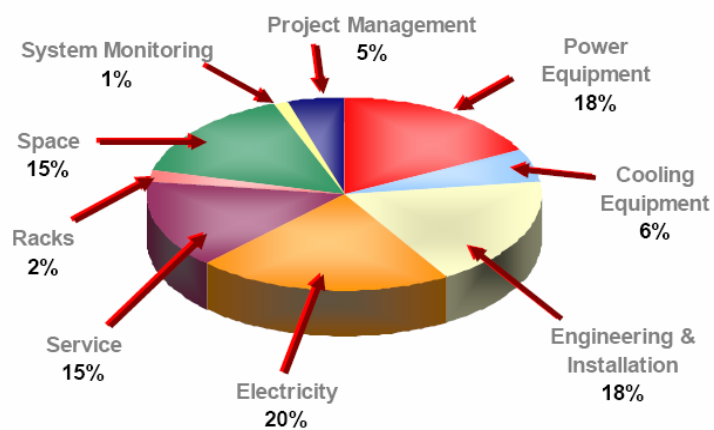


Reduce Costs

- Reduce IT costs while increasing the efficiency, utilisation and flexibility of existing computer hardware



TCO per Rack in the Data Centre



TCO = Total Cost of Ownership

Data Centre and Power Costs



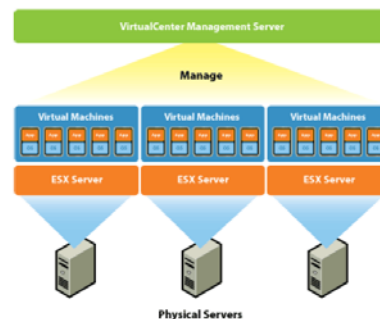
- Largest cost of Data Centre is labour - about 70%
- 80% of an IT department's budget is normally for '**keeping the lights on**' functions
- Applications virtualisation has been used by some large UK financial institutions to delay spending on new data centres of up to A\$700 million!
- Reducing the total number of servers significantly reduces power consumption, as well as reducing space needs. For example one site which had 1,200 servers, saved more than A\$100,000 per year on energy costs
- Further energy savings can be achieved by active power management, i.e. reducing CPU speeds to match demand

15

Advantages: Improved Opportunities



- The real value is helping transform organisations from siloed units into virtual business process-driven units
- But you need centralised management and monitoring tools that are suitably updated to support virtualisation
- IT governance needs to adapt to match the needs of virtualisation via the **principle of pooled resources**



16

Challenges: Reducing Barriers



- The major challenge is to make the IT infrastructure AND the culture adapt to rapidly changing business needs
- It needs a breakdown of the silo approach!
- But it needs the acceptance of cultural change i.e. to move away from the concept of physical server ownership to shared institutional ownership
- An organisation needs to be ready to accept the principle of prioritisation across departmental boundaries, plus allocate resources to meet peak and time critical demands
- If successful, it will greatly reduce barriers to new IT implementations

17

Okay for the theory, what about Lingnan University...



1. What it was like!!
2. What it is like now
3. VMware at Lingnan University
4. Cost Calculations
5. How far have we progressed
6. Our Problems...
7. Progress!!

18

What it was like (!!)



19

What it's like now!!!!!!

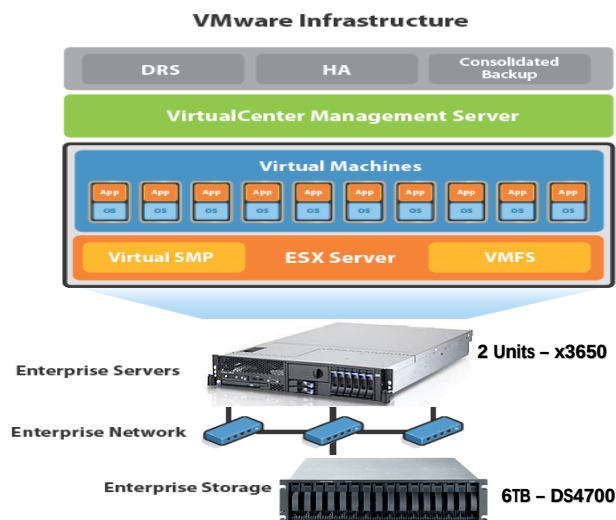


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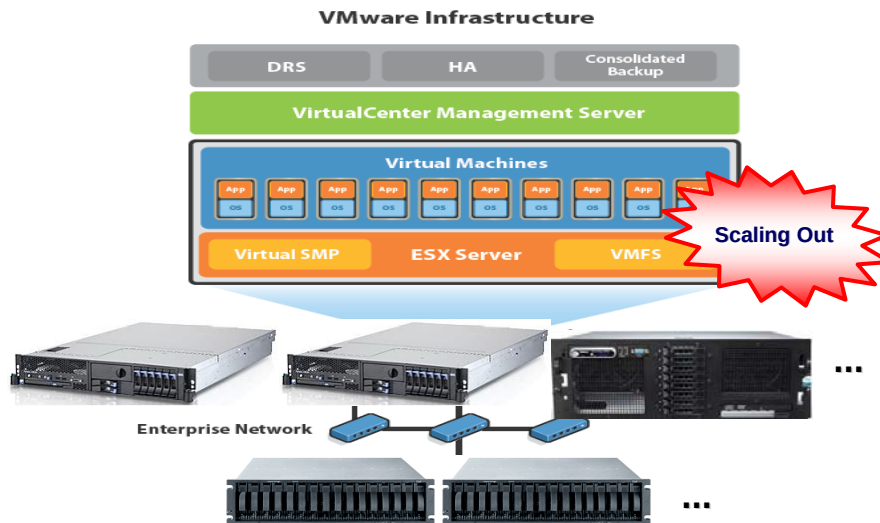
But really....



VMware at Lingnan University



Now Expanding



23

New Server Purchases



ITSC Servers only

- Any new ITSC budget request for servers is initially channeled into the VMware expansion budget
- If a new application requires a dedicated server (still for many reasons), then recycling old servers are first choice
- Servers are managed on a 5-year replacement cycle

Other IT Support Units on Campus

- We are lucky in having only a few
- The virtues of Virtualisation are discussed & demonstrated whenever the opportunity arises
- We hope the new virtual systems will talk for themselves – especially when unit managers consider cost-effectiveness

24

Cost Comparisons



Standalone Server

- Typical 'small' server costs about A\$4,000
- Rack 'costs' are about A\$1,500 for the rack, UPS, power, network interfaces, etc
- Utilised on average about 15% – efficiency is at a 'cost' of A\$40,000 per full computing unit (i.e. a fully utilised server)

Virtual Servers

- '10 pack' server typically costs about A\$40,000
- Rack 'costs' are A\$3,000 for rack, UPS, power, network...
- With 45% utilisation, the 'cost' is about A\$10,000 per unit!!
- Still only A\$20,000 if High Availability services provided

25

How far have we progressed?



Network Management Services:
DHCP, DNS, BigBrother

System Support Services:
LDAP, Student Webmail,
Staff Mailserver, Proxies

User Services:
Ghost, testing of Active Directory

Web Services:
Web Portal Servers

Name	Target	Status	Initiated by	Time	Start Time	Complete Time
Task	Alert					

Our Problems...



- It is '**MY**' server – i.e. ownership!
- Lack of support for VMware from some vendors, such as Oracle, BlackBoard, etc
- VMware software is not cheap
- Slow progress by Systems Administrators in migrating servers to the virtual environments
- Letting go of the old thinking, such as scaling a server to handle the maximum load, configuring everything possible, JUST IN CASE!
- Learning new management techniques for virtualisation

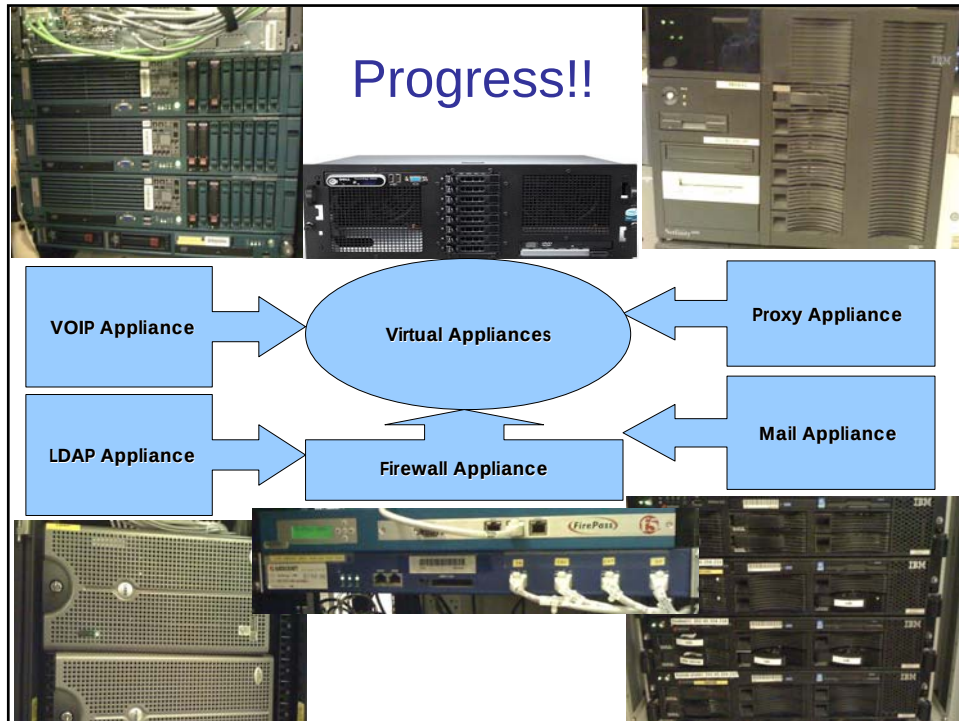
27

Sys Admin resistance



- Resistance comes because they think they 'lose control'
- But they still have full system administration control, including being able to shutdown and boot-up as needed
- They do give up some control – i.e. how much resources from the virtual cluster are allocated to their application
- But this is actually a bonus!
- In the past, if they ran out of CPU power or memory or disk space, it usually required a lengthy upgrade request or wait until the next budget cycle to get extra resources
- But with virtual servers, they can request extra resources and if approved and available in the cluster, they can receive almost immediate upgrades. IT WORKS!!!

28



The Future?



- Move ahead with our five-year server migration plans onto VMware, whenever possible
- We expect student computer labs to diminish, as many more mobile devices come onto the campus
- Mobile devices like the Apple iPhone and netbooks (e.g. Asus Eee PC, HP Mini-Note PC, DELL E Classic), which will become very popular
- So we will explore Application Virtualisation
- Desktop Virtualisation also to be investigated



So, will I get fired?

31



I don't think so!

At least not for virtualisation😊

Thank You

32



What are your
virtualisation experiences?