



Virtualization

Greening the Enterprise

Green computing ... some statistics ...

**Power consumption of the average server
has risen 4x in the past 5 years**

**The number of servers in the average rack in 2001
was 7; it is expected to rise to 20 in 2010**

**Server density in the data centre is growing
massively and this is draining power, cooling
and space resources**

Green computing ... what the analysts say ...

IT is responsible for 2% of global CO2 emissions through PCs, servers, cooling, fixed and mobile telephony, local area network (LAN), office telecommunications and printers (Gartner)

Energy amounts to less than 10% of IT budget today but could rise to as much as 50% by 2012 (Financial Times)

A datacenter with 2,500 servers uses as much energy in one MONTH as 420,000 homes use in one YEAR (Forrester)

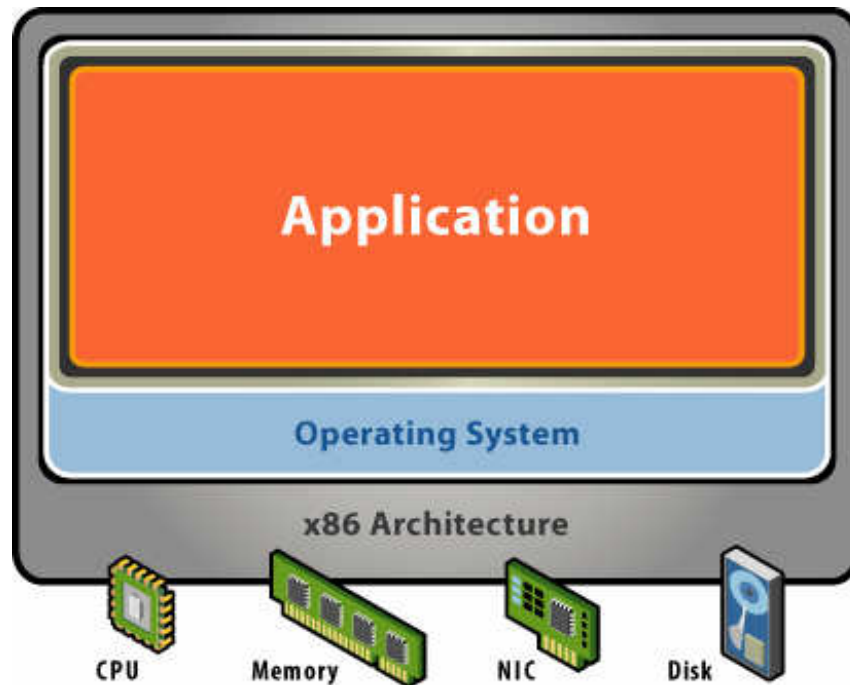
The cost to power servers will exceed the cost of the servers by next year (IDC)



Virtualization

Enabling the green datacenter

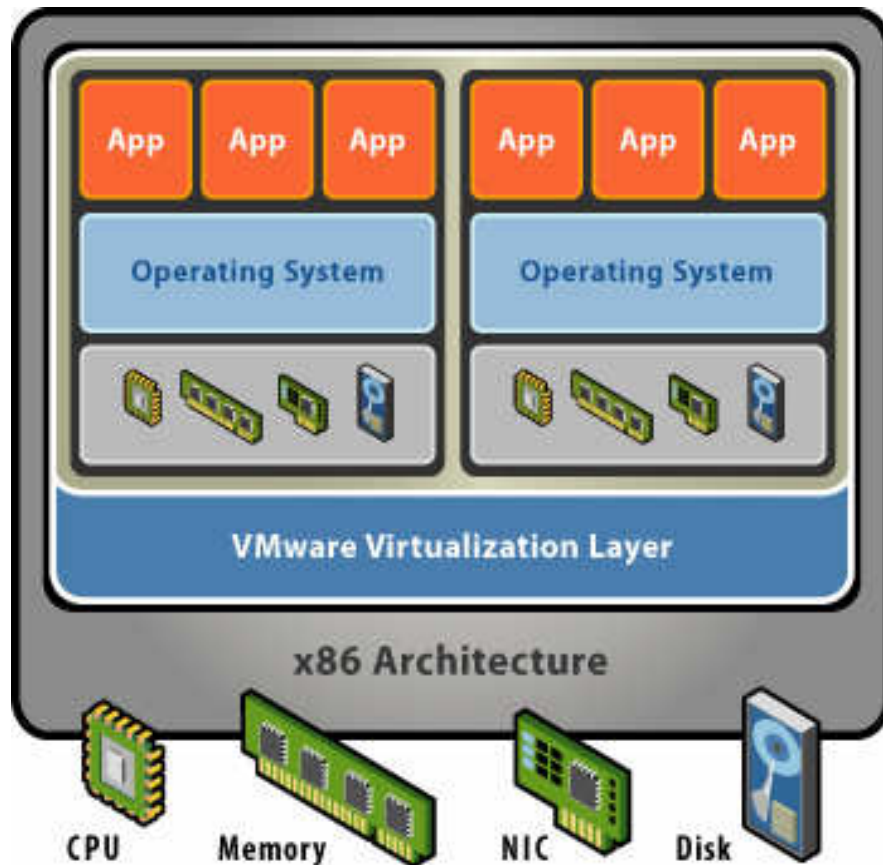
Tradition x86 Architecture



- Single OS per machine
- Software and hardware tightly coupled
- Multiple applications often conflict
- Underutilized resources introduce real cost into the infrastructure

→ **Old model doesn't work anymore!**

Virtualized x86 Architecture



- Separate OS and hardware – **break hardware dependencies**
- OS and Application as single unit by **encapsulation**
- Strong fault and security **isolation**
- **Standard, HW independent** environments can be provisioned anywhere
- **Flexibility** to chose the right OS for the right application



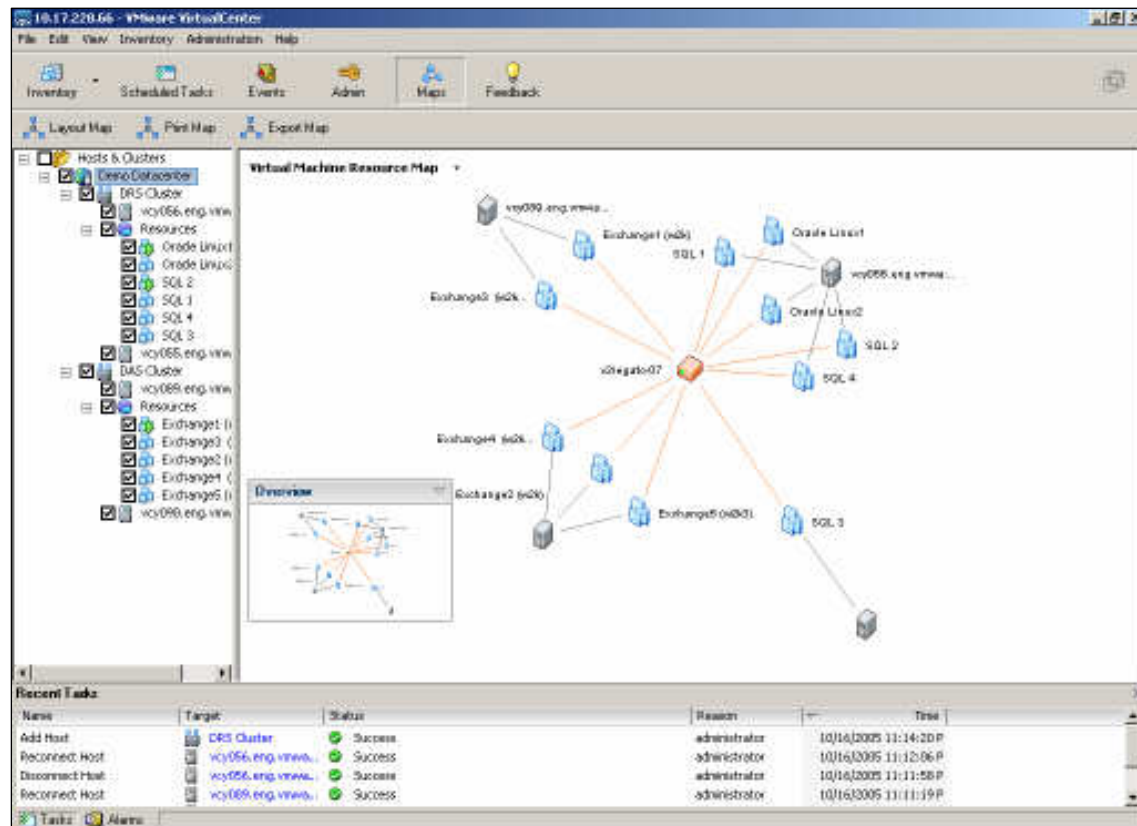
Virtualization

More flexibility

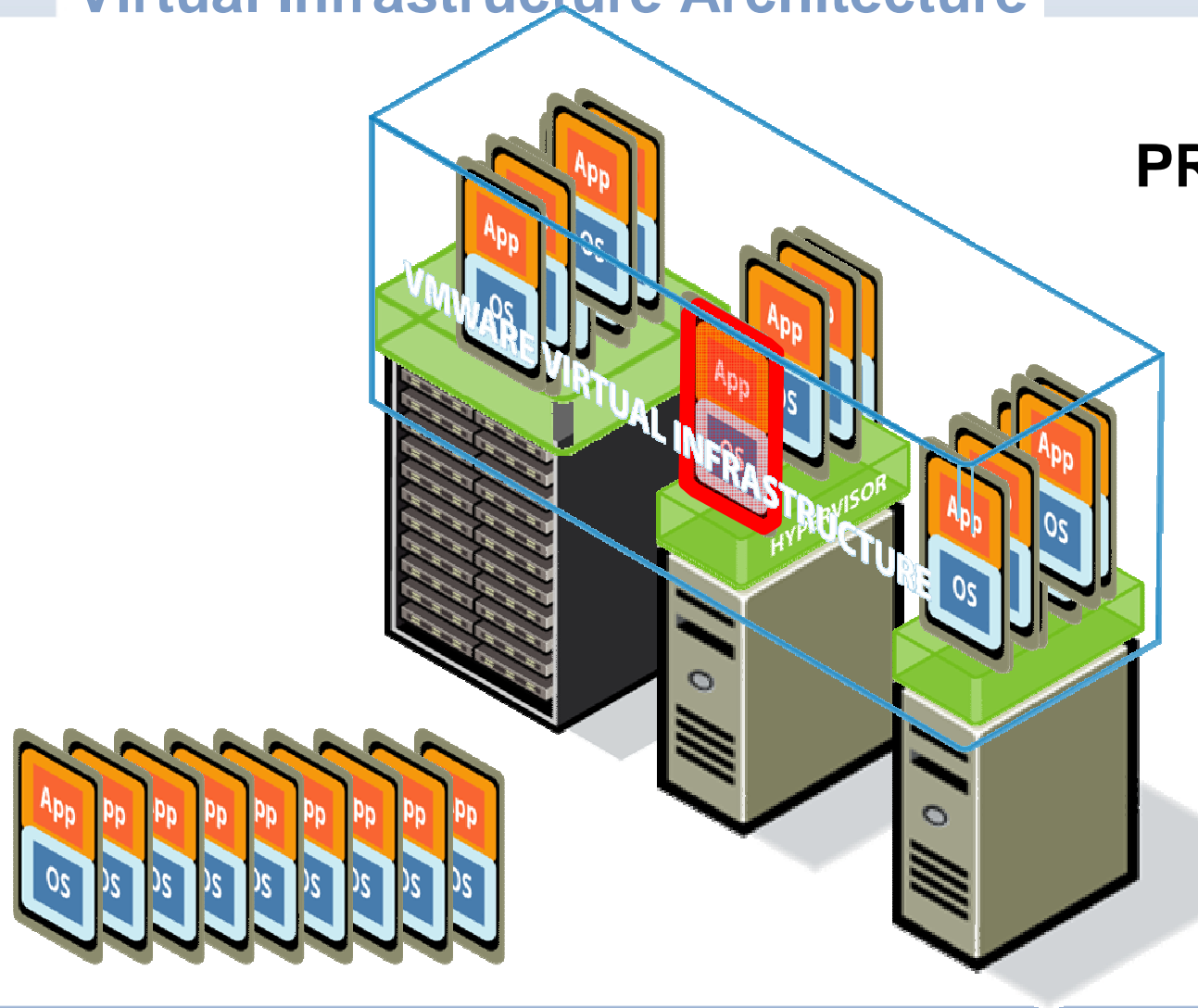
Centralized Management

VirtualCenter gives you total control over a large-scale virtual infrastructure.

- **Provision and boot** VMs
- **Monitor** system availability and performance
- **Automated** notifications and email alerting
- **Integrate** with existing management tools
- **Secure** the environment with robust access control

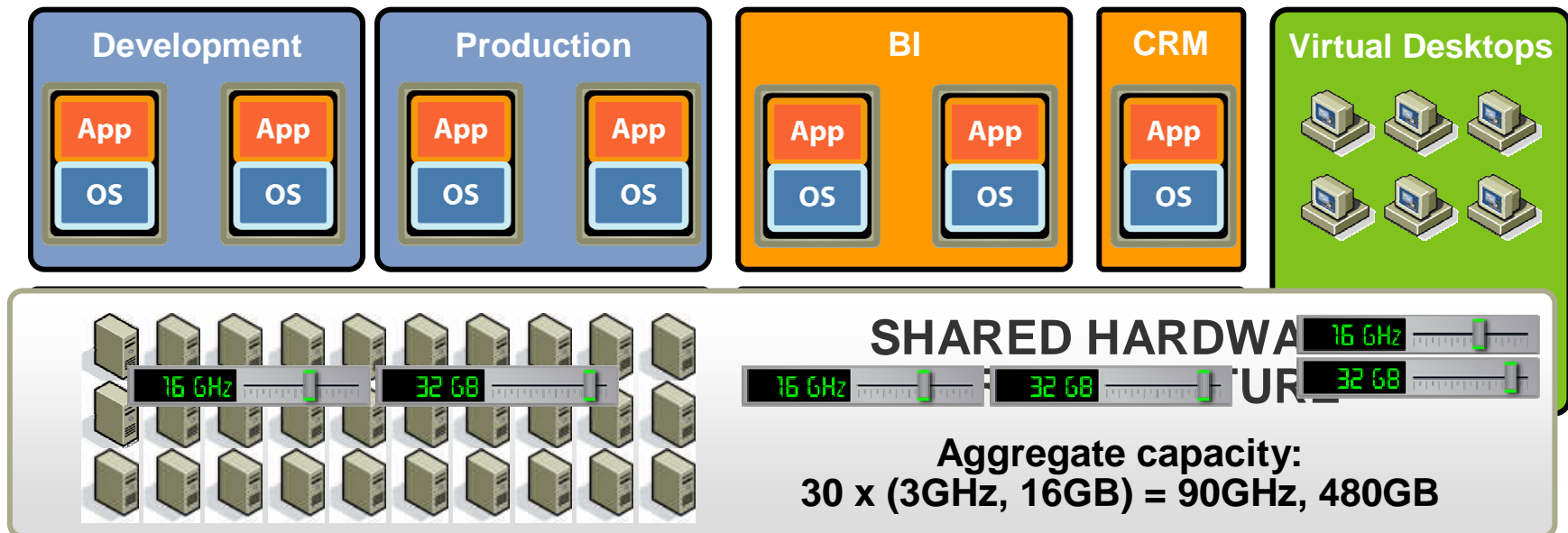


Virtual Infrastructure Architecture

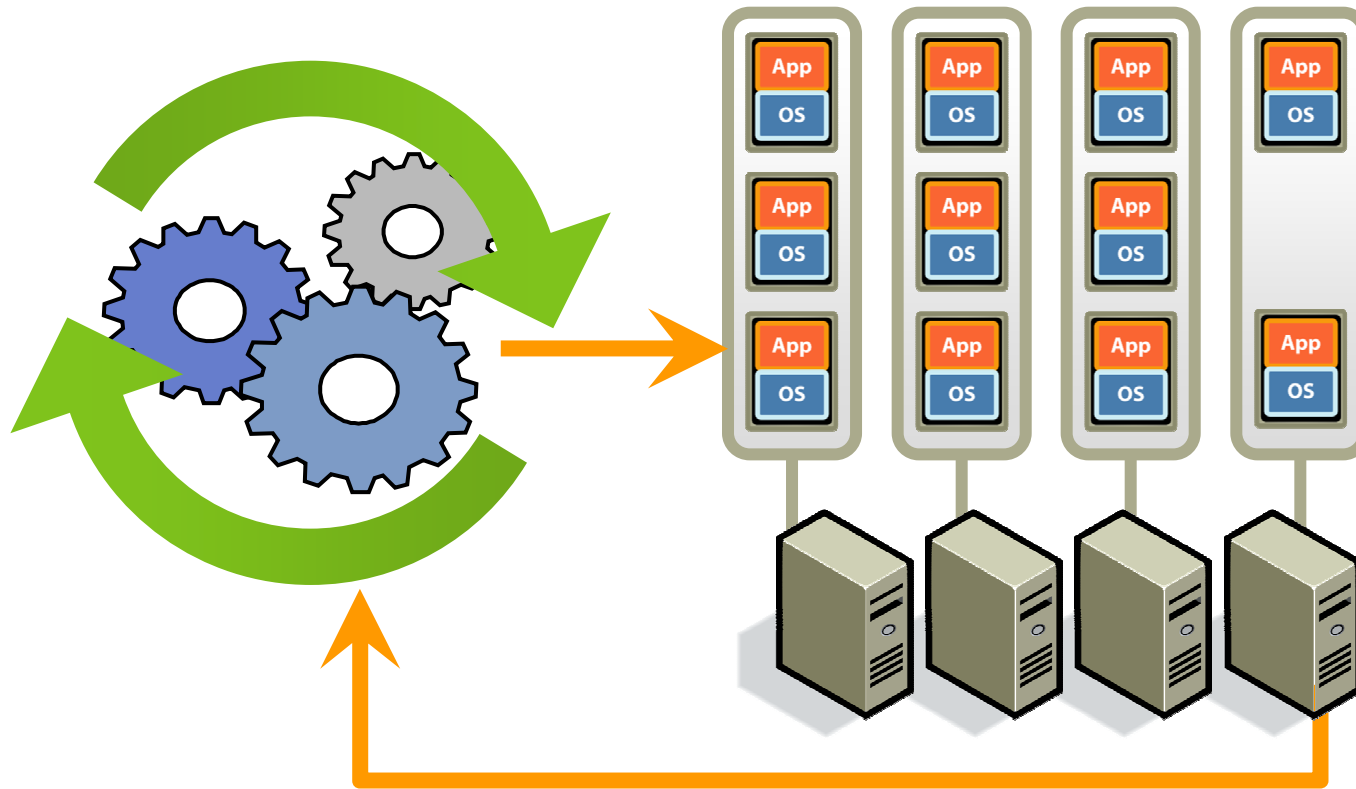


PROMISING

Align and scale capacity to business needs

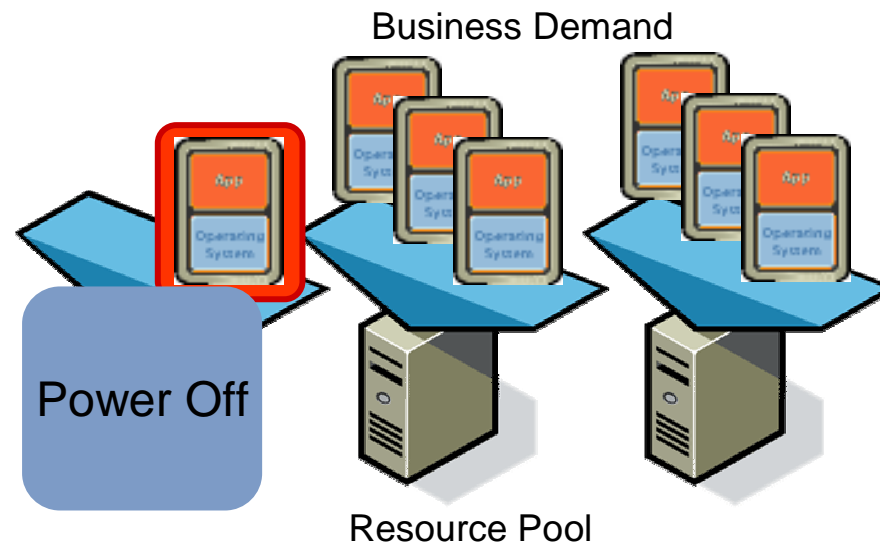


Non-disruptive capacity on demand



Distributed Power Management

- > Dynamic expansion and contraction of clustered compute capacity to provide for just-in-time efficient utilization of capacity
- > Optimizes placement of virtual machines for minimal power consumption
- > Enhancement to Distributed Resource Scheduler (DRS)
- > Provides customers with significant cost savings from reduced power consumption



These features are representative of feature areas under development. Feature commitments must not be included in contracts, purchase orders, or sales agreements of any kind. Technical feasibility and market demand will affect final delivery.

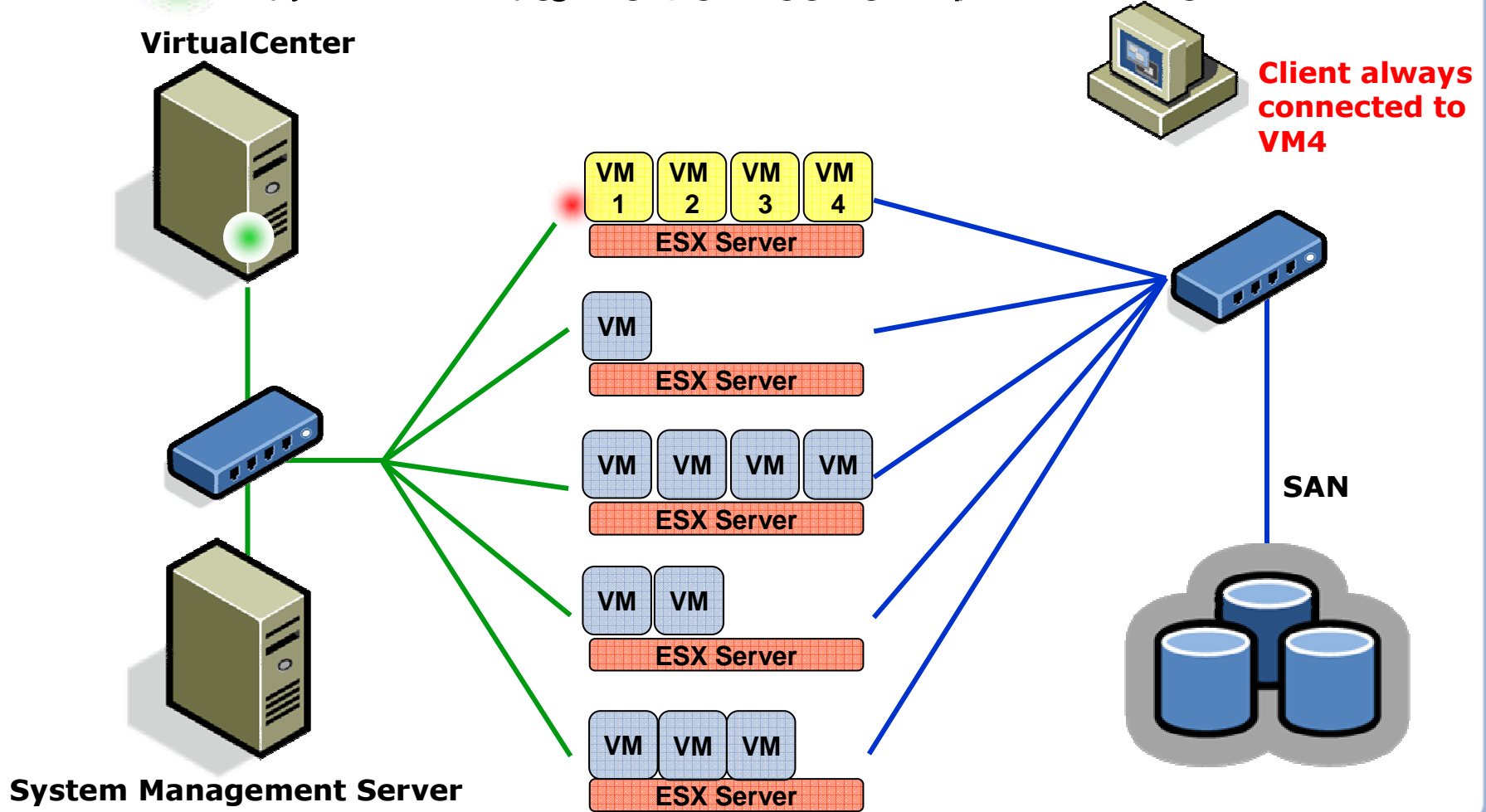


Virtualization

More reliability

Integration with Systems Management

VirtualCenter
System Management Server
ESX Server
VM
SAN
Client always connected to VM4



Slide 14

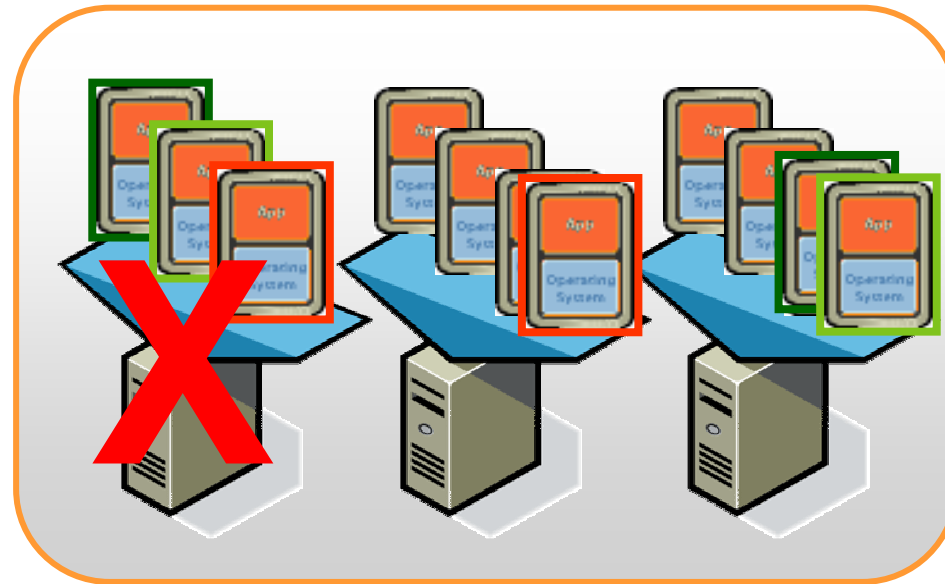
FBP3

Felipe to turn into build slide to explain the rationale behind the best practice config

Felipe Payet; 12-4-2004

Automatic availability for all applications

High Availability (HA)



Chemical Factory – Disaster Recovery in under 17 minutes

Kingsport, TN Datacenter

ESX 1

ESX 2

ESX 3

ESX 4

HP
Servers

Production Environment:
400+ VM's on
68 Physical ESX Servers

Johnson City, TN Datacenter

ESX 1

ESX 2

ESX 3

ESX 4

Dell
Servers

Back-Up/DR Environment:
400+ VM's on
50 Physical ESX Servers

SRDF



Virtualization

Spend less

Reducing Costs with Virtual Infrastructure

Lower hardware costs

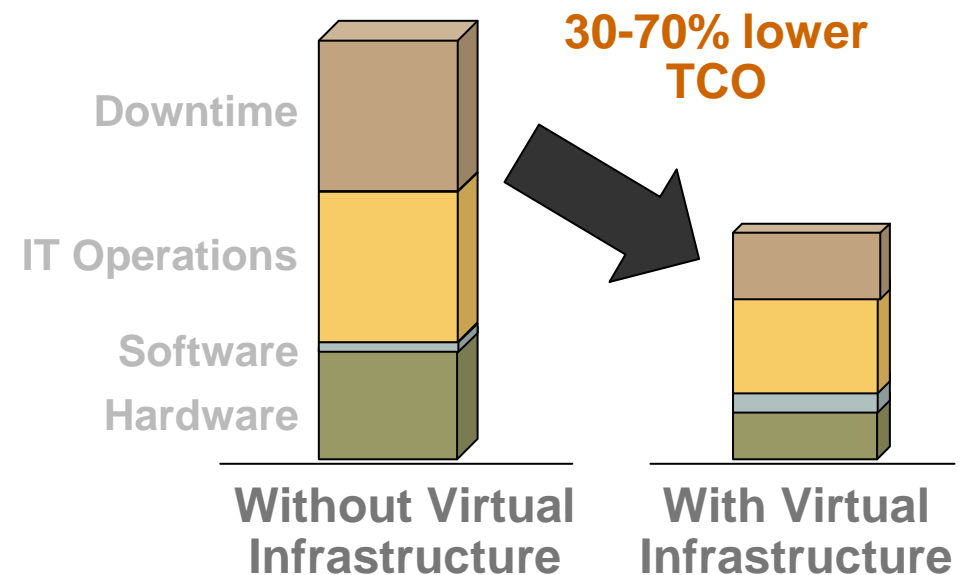
- > Fewer servers needed for production, development, testing, staging
- > Economical disaster recovery
- > Retire out-of-warranty hardware

Lower operational costs

- > Lower system administration costs
- > Reduced datacenter infrastructure costs

Reduced downtime costs

- > Less maintenance downtime
- > Cost-effective high availability and DR



Australian Savings Calculator - Ain't that the truth?



AIN'T THAT THE TRUTH?



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VMWARE VIRTUALISATION SAVINGS CALCULATOR

By Virtualising your **50** servers with VMware technology...

You could save the world:




You could save your business:












* Based on server related power consumption of a standard 2 CPU server

» Oriel makes virtualising easy, let us show you how

TCO (<http://www.vmware.com/products/vi/calculator.html>)




**VMware TCO / ROI Calculator**



Questionnaire | **VMware Infrastructure**


Analysis Options


Which opportunities would you like to address with this analysis (check all that apply):


- Data Center Server Consolidation Cost Savings (Using VMware Infrastructure)** 
- Virtual Lab Automation Benefits (Using VMware Lab Manager)** 
- Desktop Control and Manageability Cost Savings (Using VMware Virtual Desktop Infrastructure VDI)** 


Current (As Is) Data Center Server Profile (VMware Infrastructure)

What are the current number and type of servers you intend to virtualize?


Current Data Center Server Hardware Profile	Number of Data Center Servers 
1 CPU	0
2 CPU	50
4 CPU	0
8 CPU	0
16 CPU	0
32 CPU	0
Total	50

Currently, how many person hours are required to procure, prepare and provision a new server? 


How many gigabytes (GB) of storage do you have in your current environment (in total)? 

What is the percentage of current servers attached to SAN? 










[View / Edit VMware VI assumptions](#)

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TCO (<http://www.vmware.com/products/vi/calculator.html>)



VMware TCO / ROI Calculator



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Questionnaire
VMware Infrastructure

Return on Investment (ROI) 951.0%

NPV Savings (3 year, discount rate = 9.5%) € 402,068 ?

Payback Period (in months) 3

(Click thumbnails to display)

For more detailed information or to see/edit default assumptions for the VMware solution, click on the description for each line item.

Cumulative 3 Year TCO Comparison	Current (As Is)	With VI (Projected)	Difference (€ and % savings)	Exclude?
VMware Infrastructure Benefits				
Data Center Server Hardware	€ 380,485	€ 53,268	€ 327,217 86.0%	<input type="checkbox"/>
Data Center Server Storage	€ 12,082	€ 96,517	€ -84,435 -698.8%	<input type="checkbox"/>
Data Center Server Networking	€ 29,074	€ 6,461	€ 22,613 77.8%	<input type="checkbox"/>
Data Center Server Power and Cooling Consumption	€ 71,400	€ 11,489	€ 59,911 83.9%	<input type="checkbox"/>
Data Center Server Space	€ 87,865	€ 17,272	€ 70,593 80.3%	<input type="checkbox"/>
Data Center Server Provisioning	€ 23,940	€ 1,675	€ 22,265 93.0%	<input type="checkbox"/>
Data Center Server Administration	€ 263,030	€ 202,006	€ 61,024 23.2%	<input type="checkbox"/>
Data Center Server Disaster Recovery (Indirect)	€ 1,191	€ 309	€ 882 74.1%	<input type="checkbox"/>
Data Center Server Unplanned Downtime (Indirect)	€ 82,239	€ 20,514	€ 61,725 75.1%	<input type="checkbox"/>
Investment Required				
VI Software Licensing and SnS	€ 0	€ 51,548	€ -51,548 0.0%	<input type="checkbox"/>
Additional Software Licensing Costs (if any)	€ 0	€ 0	€ 0 0.0%	<input type="checkbox"/>
VI Design, Plan and Deployment Services	€ 0	€ 0	€ 0 0.0%	<input type="checkbox"/>
VI Training	€ 0	€ 0	€ 0 0.0%	<input type="checkbox"/>

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TCO (<http://www.vmware.com/products/vi/calculator.html>)

VMware TCO / ROI Calculator

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Questionnaire **VMware Infrastructure**

Expected Benefits from VI	Year 1	Year 2	Year 3	Total
Data Center Server Hardware	€ 98,857	€ 108,743	€ 119,617	€ 327,217
Data Center Server Storage	€ -25,508	€ -28,059	€ -30,868	€ -84,435
Data Center Server Networking	€ 6,832	€ 7,515	€ 8,266	€ 22,613
Data Center Server Power and Cooling Consumption	€ 18,100	€ 19,910	€ 21,901	€ 59,911
Data Center Server Space	€ 21,327	€ 23,460	€ 25,806	€ 70,593
Data Center Server Provisioning	€ 6,449	€ 7,377	€ 8,439	€ 22,265
Data Center Server Administration	€ 17,674	€ 20,219	€ 23,131	€ 61,024
Data Center Server Disaster Recovery (Indirect)	€ 294	€ 294	€ 294	€ 882
Data Center Server Unplanned Downtime (Indirect)	€ 20,575	€ 20,575	€ 20,575	€ 61,725
Total Benefits	€ 164,600	€ 180,034	€ 197,161	€ 541,795

Expected Investment in VMware Solution	Initial / Year 1	Year 2	Year 3	Total
VI Software Licensing and SnS	€ 36,820	€ 7,364	€ 7,364	€ 51,548
Additional Software Licensing Costs (if any)	€ 0	€ 0	€ 0	€ 0
VI Design, Plan and Deployment Services	€ 0	€ 0	€ 0	€ 0
VI Training	€ 0	€ 0	€ 0	€ 0
Total Costs	€ 36,820	€ 7,364	€ 7,364	€ 51,548

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Beyond Boundaries

