

Virtualization 2.0: The Next Phase in Customer Adoption



AI Gillen

Research Vice President

System Software, IDC

State of Virtualization

- Server virtualization is now considered a **mainstream technology** among IT buyers
- IT professionals are **very bullish** on future use
 - Of those virtualizing, customers report 22% servers virtualized today going to 45% in 12 months
- Core infrastructure and data center strategies are being turned **upside down!**
- Customer satisfaction is **very high**...but expectations climb as customers support **business critical applications**
- Operating Systems and layered SW **adapting to change**
- Virtualization **changes everything**
 - Advanced planning is a critical key for success



State of Infrastructure Today

Server Sprawl

- > **41 m** physical servers by 2010 - **700% increase** in 15 years
- > **Ave UT <10% = \$140 bn** in excess server capacity - a 3-year supply

Power & Cooling

- > **50c** for every \$1 spent on servers
- > **\$29B** in power and cooling industry wide
- > **Green IT** is a focus today

Space Crunch

- > **\$1,000** /sqft
- > **\$2,400** / server
- > **\$40,000** / rack
- > **Limits on expansion**; DCs cost 10s of millions to build

Operating Cost

- > **\$8** in maintenance for every \$1 spent on new infrastructure
- > **20-30 : 1** server-to-admin ratio

3 Key Virtualization Attributes

1. Application Isolation

- Applications can be encapsulated in individual VMs
 - Maintain 1 “server”, 1 app paradigm while still utilizing the hardware
 - Helps avoid all the application regression testing that must occur in shared OS environment

2. Virtual Machines Are Files

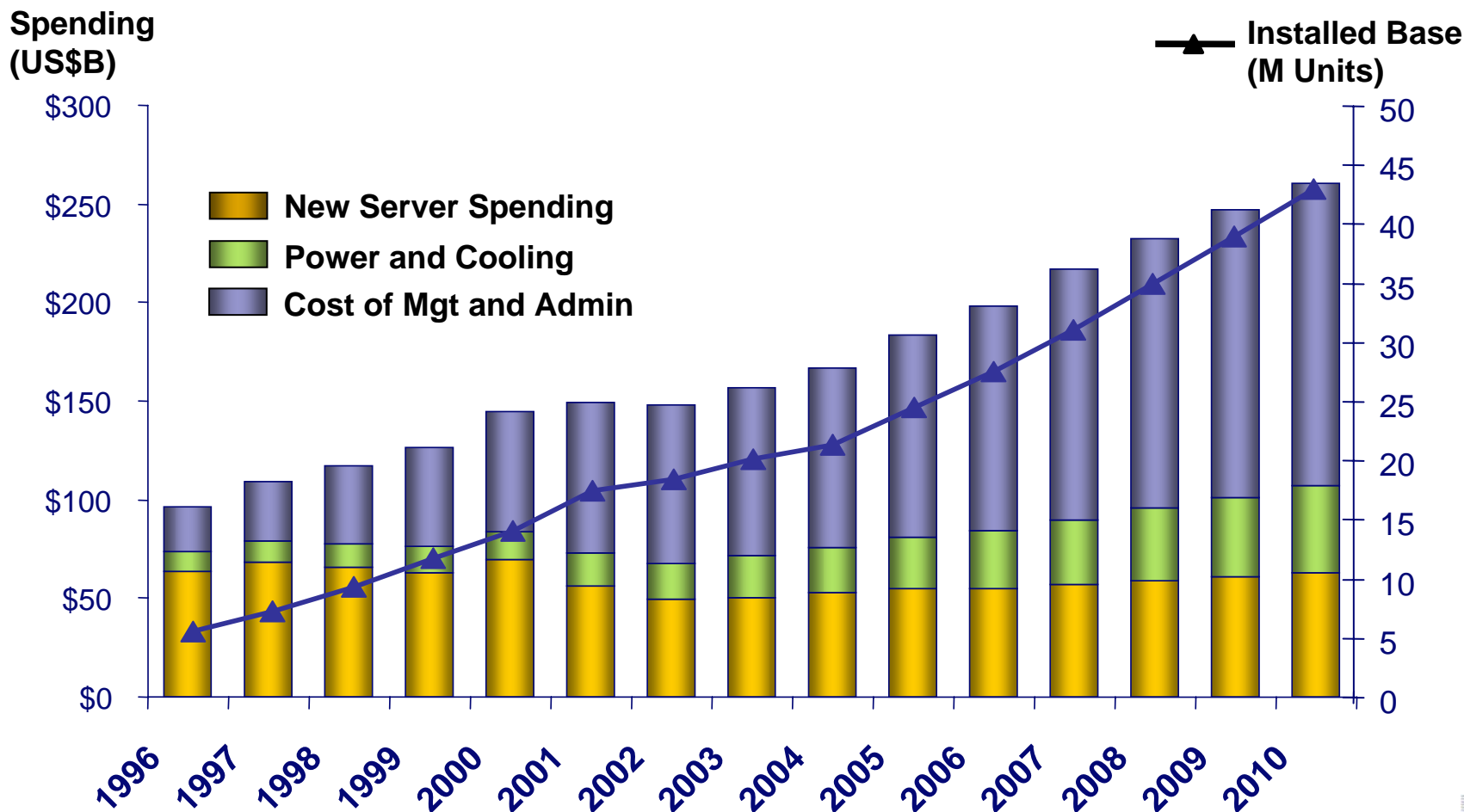
- Can be copied, backed-up, replication and moved like files!
 - Enables unique, easier, lower cost business continuity practices
 - Helps to protect a greater percentage of assets

3. Virtualization Changes IT

- Planning and deployment for future systems changes
 - Provisioning, deployment, planned downtime, capacity planning and load balancing
 - Increased flexibility and agility equates to IT “quality of life”
 - Departments and internal customers need to “get on board” as IT deployment changes



Worldwide Server Market: Cost of Management



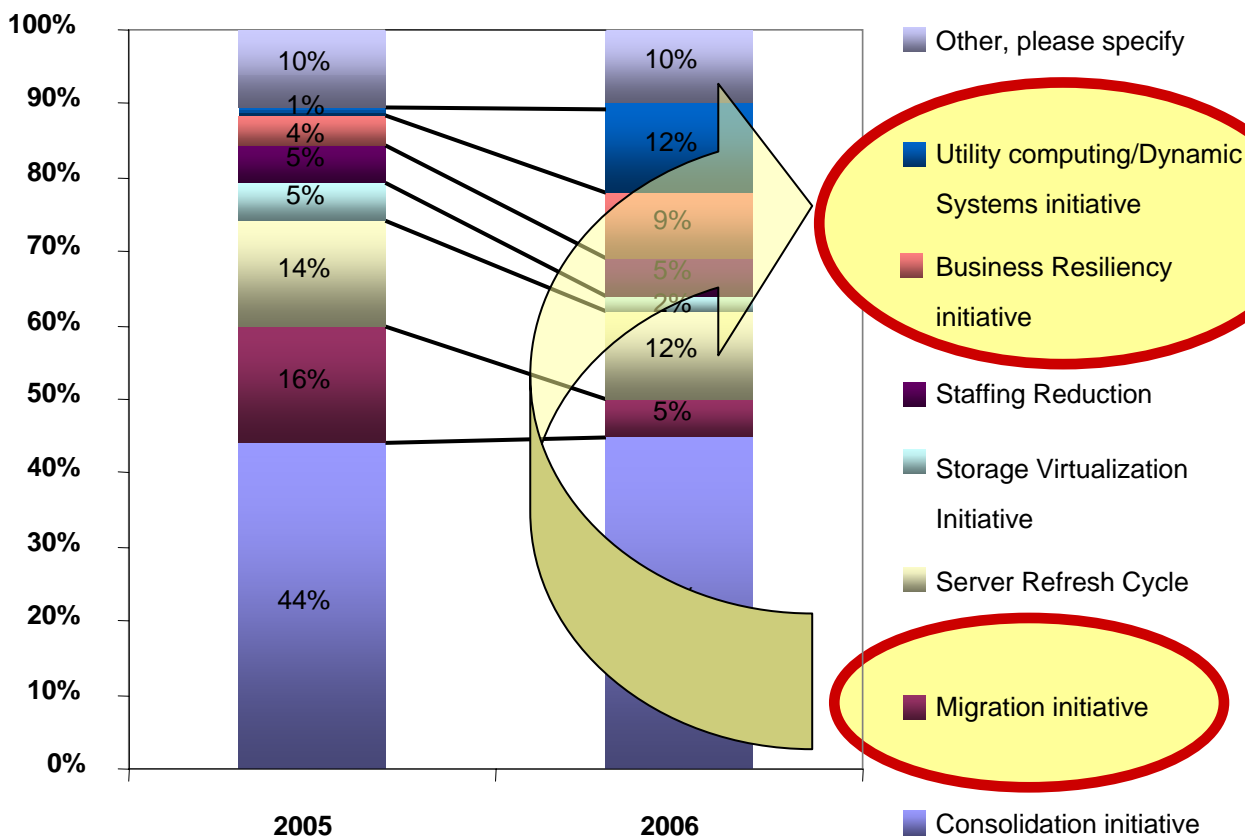
Business Case Development

- Today, half of the customer report creating a formal business case to justify their virtualization investments
 - Most believe virtualization reduced hardware installed base by 20%
- Most of the respondents believe they have saved upwards of 23% over the last 12 months by implementing virtualization
 - Hardware Savings, Real Estate, Power and Cooling
- IT savings are almost as likely to be returned to the business rather than funding other IT investments
- Cost of downtime was rarely considered...even through more than 50% of today's virtual servers support critical production workload
 - Net effect is virtualization is to create more mission critical servers

Virtualization: Changing Motivations

- Consolidation remains strong driver for virtual server use
- Users quickly consuming legacy re-host
- Business Continuity and Utility Computing are new growth engines
- These new areas account for 1/4 of spending today!

Type of Project Associated with Virtual Server Purchase

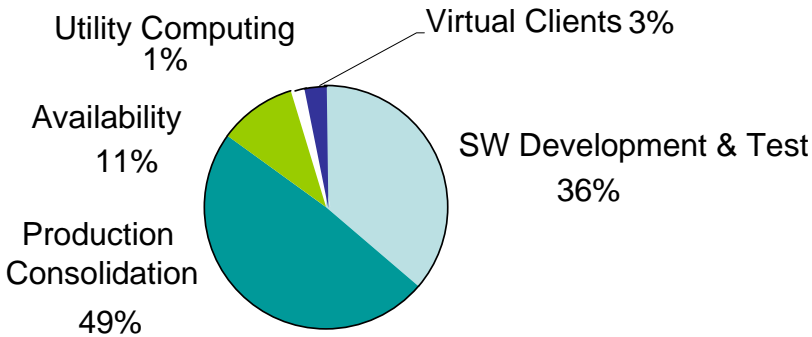


Source: IDC Virtualization Study, 2006



The Next Virtualization Milestones

2006



\$1,044M Opportunity

Virtualization 1.0

- Encapsulation
- Resource sharing
- Dynamic consolidation

CAPEX

Virtualization 2.0

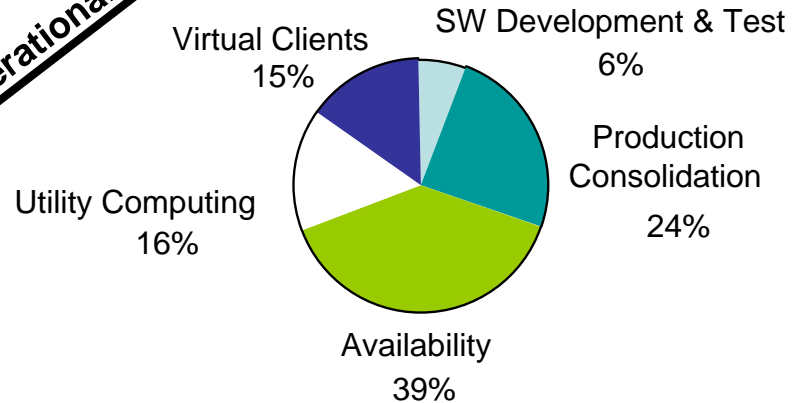
- Mobility
- Planned downtime
- Virtual Clients

Virtualization 2.5

- Unplanned
- HA/DR/back-up
- Workload balancing
- Virtual Clients

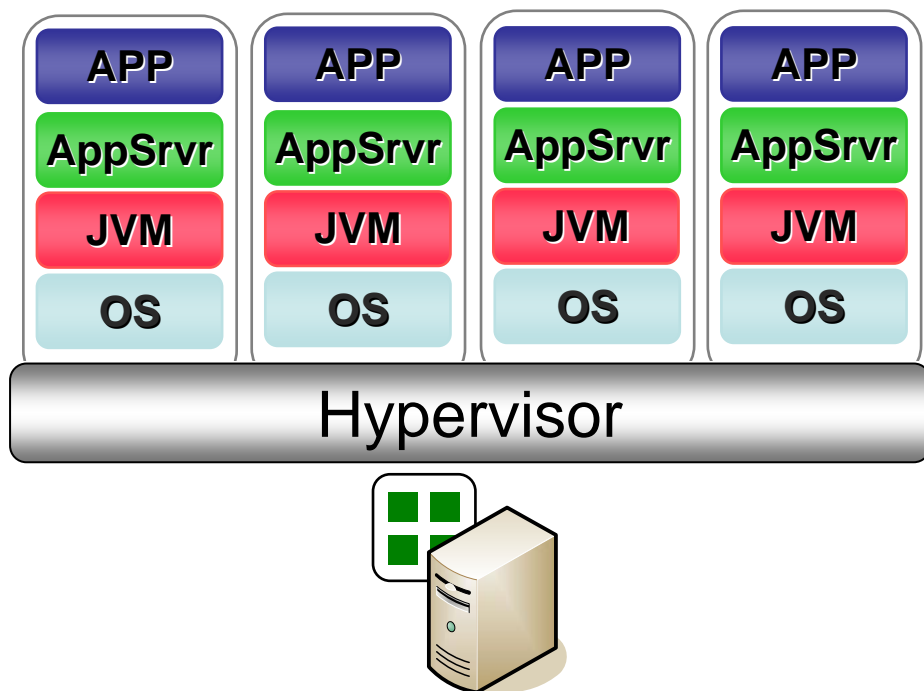
Operational Cost Reduction

2011



\$3,200M Opportunity

Meeting Service Levels



Virtualization

- Increased H/W utilization
- Homogenize the Infrastructure

BUT ...

- Each S/W layer still needs maintenance and mgmt.
- Redundant copies of OS and S/W reduces efficiency
- Increases appetite for software

Emerging Challenges *Server Virtualization Hurdles*

- Increasing User Expectations
- Virtual Machine Sprawl
- Image /Change Management
- Coordinated Data Replication
- Application Awareness
- Appliances – where when and how?
- Security at the VM
- Network Configuration
- Usage Metering and Chargeback



Source: IDC Virtualization Study, 2006

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Key Takeaways

- Virtualization: A great vehicle to improve capital **and operational** efficiencies
- Great tool for a **variety of business issues**
 - Server Consolidation
 - Business Continuity
 - Virtual Clients
 - Creating Resource Pools
- The dynamic data center requires **integration**
 - Coordination of virtualization, failover, data replication, applications, and process automation tools is key



Top 10 Virtualization Questions

1. What is it you are trying to accomplish?
 - Client/server consolidation
 - Application isolation
 - Increase business agility, protect IT assets, or simply reduce HW costs/improve utilization?
2. Have you done a virtualization skills assessment?
 - Is there a tiger team in place that draws from server, storage and network infrastructure teams?
3. How are you planning to change your IT process both to account for virtualization and to fully capture the benefits?
4. What applications do you want to virtualize?
 - How is performance in a virtual environment?
5. Have you garnered support across the organization – executive, business unit as well as IT teams?

Top 10 Virtualization Questions

6. Have you considered your business continuity plans?
 - Virtualization concentrates risk, creates more mission critical servers
7. What applications should be consolidated together?
 - More art than science today – but assessment tools are emerging
8. Have you looked at application support / licensing implications?
 - Some apps don't support virtualization; does it make economic sense to virtualize?
9. Do you need live migration?
 - It's a great peace-of-mind tool but it has network implications
 - Further complicates licensing and hardware requirements
10. Is your infrastructure ready?
 - 64-bit, virtualization hardware extensions, etc?
 - Management and software lifecycle tools in place?

Essential Guidance

- **Make sure to do a ROI analysis**
 - **Emphasis hard costs** first; factor in future server growth projections
 - **Server, Power and Cooling** benefits are all well documented
- **Factor in process improvements to reduce soft costs**
 - Don't overlook **cost of downtime**
 - Look to change **server to admin** ratios
 - Agility, provisioning time, **IT responsiveness** can all be improved with virtualization
- **Start small – and look at IT processes from the start**
 - **Implement lifecycle management** practices that include archival otherwise virtual machine sprawl can overwhelm
 - **Test and refine** – both in terms of technology implementation and business case
- **Invest in virtualization skills** – create a **virtualization team**



Questions?



Al Gillen
agillen@idc.com
732-842-4276