End to End Virtualization with HP

Vishal Chandane
The Evolution to a Virtual Datacenter

**Techno-centric**
Consolidation

**Service-centric**
Shared infrastructure

**Business-centric**
Unified, automated management

Business view of IT: a problem... a solution... a partnership

- Consolidate IT resources: server, storage, applications
- Create a shared infrastructure utility that can be used by several lines of business
- Manage and administer multiple forms and platforms of virtualization
What is a virtual data center?

<table>
<thead>
<tr>
<th>Traditional Data Center</th>
<th>Virtual Data Center</th>
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<tbody>
<tr>
<td>Designed to Last</td>
<td>Designed to Change</td>
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<tr>
<td>Tightly Coupled Stack of Project &amp; Application/Infrastructure</td>
<td>Loosely Coupled, Agile and Adaptive</td>
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<tr>
<td>Manages Physical Resources</td>
<td>Manages Virtual Resources</td>
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<tr>
<td>Integrate Silos</td>
<td>Compose Data Center Services</td>
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<tr>
<td>Under utilized &amp; Over-provisioned with Static Workloads</td>
<td>Shared &amp; Pooled with Policy Based Dynamic Workload Mgmt</td>
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<tr>
<td>Storage Directly Attached</td>
<td>Virtual Storage Grids</td>
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<td>Reactive Problem solving</td>
<td>Proactive: Service Level Management</td>
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<td>Long deployment Cycle</td>
<td>Rapid Deployment Cycle</td>
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<tr>
<td>Cost centered</td>
<td>Business &amp;delivered as IT Shared Services</td>
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</table>
Peering Into the Paradox: How Benefits Become Challenges

Advantages
- Enhances availability
- Improves utilization
- Reduces costs
- Speeds provisioning
- Increases consolidation
- Reduces staffing
- Creates optimism

Disadvantages
- Magnifies failures
- Affects performance
- Encourages sprawl
- Handicaps compliance
- Creates "pods"
- Requires new skills
- Engenders skepticism

Virtual machines help you to recover from your mistakes… but not necessarily in preventing them!
Virtualization Economics: Keeping It Real!

The New Math: \[ V_{\text{cost}} = \text{Free} \]

One client alluded to it as being "addictive."

The Real Math: \[ V_{\text{cost}} = f(\text{Design, Testing, Administration, Monitoring, Security, Compliance, Optimization}) \]
Virtual Datacenter and HP
# HP Virtualization Solution Building Blocks

<table>
<thead>
<tr>
<th>Services and Expertise</th>
<th>Plan</th>
<th>Deploy</th>
<th>Operate</th>
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<tbody>
<tr>
<td>Management</td>
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<tr>
<td>HP Systems Insight Manager</td>
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<td>Core management services</td>
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<tr>
<td>Physical Virtualization layer and guests</td>
<td>VM</td>
<td>VM</td>
<td>VM</td>
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<tr>
<td>Hypervisor</td>
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<td>Physical platform</td>
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<tr>
<td>HP Servers and Storage</td>
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</tbody>
</table>

- **Assess**
- **Migrate**
- **Provision**
- **Manage**
- **Control**
- **Patch**
Physical Platform

- Services and Expertise
  - Plan
  - Deploy
  - Operate
  - Support and Subscription

Management
- IP Insight Software + VMware VC
- Core management services
- Physical Virtual
- Access
- Migrate
- Provision
- Manage
- Control
- Patch

Virtualization layer and guests
- Hypervisor

Physical platform
- HP Servers and Storage
The HP BladeSystem approach to simplify infrastructure

Consolidate
- Modularize and integrate components
- Surround with intelligence
- Manage as one

Virtualize
- Create logical, abstracted connection to LAN/SAN
- Pool and share server, storage, network, and power

Automate
- Simplify routine tasks and processes to save time
- Keep control

Reduce time and cost to buy, build and maintain
Greater resource efficiency and flexibility
Free IT resources for revenue bearing projects
Vmware with HP

Services and Expertise

Management

Virtualization layer and guests

Physical platform

Plan
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Operate
Support and Subscription
HP Insight Software + VMware VC
Core management services
Physical
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Control
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VM
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VM
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VM
Hypervisor
HP Servers and Storage
HP and VMware Leadership Facts

- **HP has the most VMware certified servers:** nearly as many as Dell and IBM combined, and twice as many servers certified for VMware ESXi.
  - VMware Systems Compatibility Guide 3 SEP 08

- **The DL785 G5 and DL585 G5 have the leading VMmark performance results in their class.** The DL785 8-socket ran the largest # of VMs ever on an x86 platform – 96, nearly 600 VMs per 42U rack. The DL585 G5 ran 60 VMs to achieve a new record.
  - VMware VMmark results, 4 SEP 08

- **HP has more VMware Certified Professionals (VCPs) than anyone – except VMware.** The exact number is 655 (486 from HP and 169 from EDS). EDS plans to add 330 VCPs in the next 15 months.
  - VMware

- **IDC names HP the Global Leader of Thin Clients Worldwide.**
  - IDC, Q1 2008 WW Ent. Thin Client Q-View, MAY 08

- **HP is the first** VMware Authorized Training Center to train more than 10,000 students on VMware certification courses.
  - VMware
Infrastructure Management

Services and Expertise

Management

Virtualization layer and guests

Physical platform

Plan Deploy Operate

Support and Subscription

HP Insight Software + VMware VC

Core management services

Physical

Virtual

Assess Migrate Provision Manage Control Patch

VM VM VM VM VM VM VM

Hypervisor

HP Servers and Storage
Running virtual infrastructure…

Is a physical server infrastructure

How do you optimize…

- Server availability
- Server rapid recover
- VMware ESX deployment
- Sufficient power for workloads
- Physical and virtual performance
- Physical infrastructure warranty & service contracts
- Remote resource management
- Server & power capacity planning
- Server repurpose and migration
- Planned Maintenance

BladeSystem Networking Abstraction Layer
The HP Insight Software Portfolio
Continuously controlling and optimizing HP platforms

Core services and unified console included with the platform
All just by using HP Insight Control
Your total solution to controlling time and your infrastructure

And save time by using integrated management tools

It’s optimizing your infrastructure (virtualization, energy & cooling)

It’s deploying in less time

Monitoring smarter and faster

Less time worrying about Security

Saving time by administering remotely
Power of HP + VMware
High Availability in failure AND pre-failure conditions

VMM + SIM as part of HP Insight Control Management Suite provides unified physical and virtual server management

- Physical: HP SIM receives ProLiant pre-failure hardware alerts
- Virtual: VMM works with VMware VirtualCenter to move VMs BEFORE server failure
- Integrates with VMware Distributed Resource Scheduler (DRS)
- VMware HA restarts VMs AFTER server failure

Only HP provides out of box solution
HP Virtualisation Manager
Control physical and virtual resources in the same way

View and Manage HPVM’s

HP BladeSystem Integrated Manager
View and Manage VMware VMs
Power Management
New HP Insight Dynamics - VSE: In action

- Logical server: A server profile that is easily created and freely moved across physical and virtual machines.

Logical servers can be physical blades. They can be easily moved.

Logical servers can be virtual machines.

Logical servers can be stored templates.
New HP Insight Dynamics - VSE: In action

- 5-star rating system makes it easy to identify best-fit placement

No Stars: poor fit

Five Stars: excellent fit
New HP Insight Dynamics - VSE: In action

- Capacity planning for larger consolidations in hours with Smart Solver technology
HP capacity planning with easy-to-use 5-star ratings

Servers are provisioned and redeployed based on best fit algorithms.

<table>
<thead>
<tr>
<th>Moving Workload:</th>
<th>Name</th>
<th>CPU Utilization</th>
<th>Memory Utilization</th>
<th>Network I/O Utilization</th>
<th>Disk I/O Utilization</th>
<th>CPU Multiplier</th>
<th>Memory Multiplier</th>
<th>Forecast Growth Rate</th>
<th>CPU Network I/O</th>
<th>Memory Disk I/O</th>
<th>Contained In</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>new_app_server</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>1.0</td>
<td>1.0</td>
<td>0% / 0%</td>
<td></td>
<td></td>
<td>Not Assigned/Parked</td>
</tr>
</tbody>
</table>

Note:
The current simulation contains both historical and projected data.
Parked workload utilization values are not relevant until the workload has been moved to a system.

To: (Selected System)

<table>
<thead>
<tr>
<th>System Name</th>
<th>Headroom Rating</th>
<th>CPU Utilization</th>
<th>Memory Utilization</th>
<th>Network I/O Utilization</th>
<th>Disk I/O Utilization</th>
<th>Platform</th>
<th>System Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>akroy01</td>
<td></td>
<td>33.29/38.64 %</td>
<td>76.00/80.40 %</td>
<td>96.66/103.96 %</td>
<td>6.37/9.71 %</td>
<td>Windows® ProLiant DL145 G2</td>
<td>Server, Windows Server, HP ProLiant</td>
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<tr>
<td>akroy01</td>
<td></td>
<td>73.93/78.75 %</td>
<td>76.46/80.77 %</td>
<td>86.86/12.57 %</td>
<td>6.69/12.92 %</td>
<td>Windows® ProLiant DL145 G2</td>
<td>Server, Windows Server, HP ProLiant</td>
</tr>
<tr>
<td>akroy02</td>
<td></td>
<td>60.20/66.35 %</td>
<td>65.85/108.46 %</td>
<td>86.21/10.36 %</td>
<td>8.46/12.43 %</td>
<td>Windows® ProLiant DL145 G2</td>
<td>Server, Windows Server, HP ProLiant</td>
</tr>
<tr>
<td>akroy03</td>
<td></td>
<td>69.38/62.93 %</td>
<td>62.80/12.95 %</td>
<td>35.15/100.93 %</td>
<td>16.05/16.83 %</td>
<td>Windows® ProLiant DL145 G2</td>
<td>Server, Windows Server, HP ProLiant</td>
</tr>
<tr>
<td>akroy04</td>
<td></td>
<td>95.49/96.65 %</td>
<td>79.68/96.64 %</td>
<td>41.85/101.12 %</td>
<td>14.13/7.41 %</td>
<td>Windows® ProLiant DL145 G2</td>
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<tr>
<td>akroy06</td>
<td></td>
<td>100.00/110.70 %</td>
<td>90.17/12.17 %</td>
<td>40.15/162.21 %</td>
<td>3.30/25.25 %</td>
<td>Windows® ProLiant DL145 G2</td>
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HP Insight Dynamics – VSE: Capacity planning to optimize utilization

The new math: 8 + 8 = 12

- Peaks for different workloads do not all happen at the same time.

- Two workloads each have an 8 CPU peak demand but the peak of their sum is 12 CPUs.
Forecasting utilization is easy

- Enter a growth rate for a workload we will synthesize a trace for it
- Trending analysis will help find the growth rate when there is no business plan
There will be some physical servers in your datacenter !!!
Bring flexibility of virtualization to physical servers

HP Logical Server technology

- A server profile that is easily created and freely moved across physical and virtual machines

Logical servers can be:

- Active physical blade servers
- Active virtual machines
- Offline templates
Unified Infrastructure Management
Operation and management of servers and storage across multiple platforms from a single interface
Eliminate management complexity

HP SIM users see real results
- Server to administrator ratio doubled
- Administration costs declined by 29%
- Downtime reduced 77%

Source: IDC study of HP SIM users, June 2007

HP Software

HP Systems Insight Manager

Physical and virtual platforms

Runs natively on:

Insight Control
Virtual Server Environment
Storage Essentials
Service Essentials

Supported Operating Systems

HP-UX
NonStop
...and more...

Microsoft
vmware
## Services and Expertise

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Virtualization Steps

1. Virtualization solution design
2. Getting infrastructure ready
3. Operation integration
4. Service delivery and monitoring
5. Maintaining SLA for the service
6. Managing server migrations
7. Reporting
Virtualization Consulting Services

- Design virtualization solution
- Virtualization Service delivery design
- Operation orchestration process
- Service monitoring and reporting
- Service chargeback design and integration
- Service security design
“HP was one of the first companies to recognize the importance of virtualization and is a leader in this area. The power of HP’s virtualization strategy lies with its integrated approach, including hardware, management software and services, to offer a complete and flexible solution.”

Vernon Turner
Vice President and General Manager
IDC Group
Technology for better business outcomes